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ANALYSIS OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER RESOURCES BY RESEARCH AND DEVELOPMENT CENTERS AND LABORATORIES IN THE U.S. ARMY

by

Robert V. Hubbard and Kathleen F. Zaccardo

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This report describes the methodology, findings, and recommendations of a study of the use of Defense Technical Information Center (DTIC) resources and services by organizations in the Army Research and Development (R&D) Community. The purpose of the study was to investigate Army R&D use of and contribution to DTIC information resources and services, assess the benefits that the availability and use of DTIC resources provides to Army R&D, and develop recommendations for actions the Army might take to use and support DTIC more effectively.

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ABSTRACT

This report describes the methodology, findings, and recommendations of a study of the use of Defense Technical Information Center (DTIC) resources and services by organizations in the Army Research and Development (R&D) Community. The purpose of the study was to identify the benefits that Army R&D agencies are realizing from the use of DTIC and to develop recommendations for actions the Army might take to use and support that organization more effectively. This study was conducted from September 1984 through September 1985 under the sponsorship of the Principal Army Technical Information Officer, Office of the Deputy Chief of Staff for Technology Planning and Management, Headquarters, Army Materiel Command as required by the Statement of Work for Task 5, Contract No. DAAD05-84-C-0189.

PREFACE

The study purpose was to identify the benefits realized by Army R&D laboratories through use of DTIC resources and to identify actions the Army can take to use and support DTIC more effectively.

Army scientists and engineers find DTIC to be a unique information source. About 60% of them use DTIC, and 47% value it highly. **Benefits realized include cost avoidance, savings in time, reduction of duplication of effort, and technology transfer.** Estimates by scientists and engineers who could attach time and dollar savings to their use of DTIC information suggest that DTIC may be saving Army R&D laboratories 40 to 50 million dollars per year and reducing project time.

DTIC information is provided to Army users by technical libraries. One of every three people on the library staffs spends all or most of his or her time processing DTIC information.

Specific recommendations for the Army are as follows.

- **Publicize the importance of using DTIC information and the procedures for its use.**
- **Continue and increase ongoing management action to ensure that Army technical reports and work unit summaries are submitted to DTIC.**
- **Procure more capable equipment for library use of the Defense R&D On-Line System (DROLS) and reproduction of paper copies of documents on microfiche supplied by DTIC.**
- **Encourage scientists and engineers to use the DTIC Current Awareness Bibliography Service.**
- **All Army technical libraries should participate in the Shared Bibliographic Input Network (SBIN) program.**

ACKNOWLEDGEMENT

The sponsor and authors of this study wish to acknowledge the many people who contributed to it. These people include the following:

- Members of the Defense Technical Information Center staff, who cooperated so willingly in explaining their operations--particularly Mr. Allan Kuhn, the DTIC point of contact for the study
- Technical library personnel at the Ballistic Research Laboratory, Chemical Research and Development Center, Harry Diamond Laboratories, Belvoir Research and Development Center, and the Redstone Scientific Information Center, who helped with the development of the library survey questionnaire and provided background information on Army R&D use of DTIC resources
- The R&D scientists and engineers at BRL and the Harry Diamond Laboratories, who helped test the end-user survey questionnaires
- The 21 Army technical libraries that participated in the library survey
- The points of contact at 25 Army R&D laboratories and centers who administered the end-user survey
- The 3,200 R&D scientists and engineers who completed and returned survey questionnaires.

It would have been impossible to accomplish this study without the assistance of these people.

SUMMARY

PURPOSE OF THE STUDY

1. The specific purposes of the study were as follows:

- To investigate Army R&D use of and contribution to the information resources and services provided by DTIC
- To assess the benefits that the availability and use of DTIC resources provides to Army R&D
- To identify any actions that may be taken by the Army to enhance the benefits it receives from exploitation of DTIC resources and its support of DTIC.

2. The Office of the Deputy Chief of Staff for Technology Planning and Management (AMCLD), Headquarters, AMC sponsored the study. Presearch Incorporated conducted the study from September 1984 through September 1985 under Contract No. DAAD05-84-C-0189.

PROBLEM

3. The Office of the Deputy Chief of Staff for Technology Planning and Management has insufficient hard data about the extent to which bench-level scientists and engineers in the AMC R&D centers and laboratories use DTIC information and services, the procedures they use to obtain it, and the benefits Army R&D gains from its use of DTIC resources. Without adequate data, the extent to which AMC managers can assure effective communication of technical information and assist technology transfer is limited.

METHODOLOGY

4. This analysis was based on survey data collected from 3,200 Army R&D centers and laboratories and from 21 technical libraries that support them. The survey data were supplemented by literature search and interviews of AMC, DTIC, and technical library staff.

GENERAL OBSERVATIONS

Realization of STIP Objectives

5. The availability of DTIC resources and services helps the Army R&D Community to benefit from and foster the objectives of

the DoD Scientific and Technical Information Program (STIP). [1/] The availability of the DTIC automated data bases and the Technical Reports Collection enables Army R&D activities to realize the following benefits:

- Technology transfer
- Reduction of duplication of effort among the Defense R&D activities and their contractors
- Reduction of the amount of time required to obtain information
- Identification of people working in the same technical areas
- Reduction in the time required to complete R&D projects
- Reduction in costs
- Improved cost-benefit factors.

DTIC is a Unique Information Source

6. Many Army R&D scientists, engineers, and information specialists rely on DTIC for information not obtainable elsewhere.

Extensive Use of DTIC by Army Technical Libraries

7. Fifty-seven of the 155 personnel in the 21 Army technical libraries that responded to the survey spend all or a significant part of their time on tasks involving DTIC.

Use and Value of DTIC Products to R&D Scientists and Engineers

8. Of the 3,200 responding Army R&D scientists and engineers:

- 75% are aware of DTIC
- 60% use DTIC products and services
- 47% rate DTIC resources as being of moderate to very high value to their work.

[1/] Reference AR 70-45, Scientific and Technical Information Program, 1 January 1984.

Use of DTIC Resources Saves the Army Time and Money

9. A group of 113 scientists and engineers who value DTIC resources highly estimated that use of DTIC resources had saved them a total of over 10 man-years of effort during the past year. Thirty-six of these respondents estimated that use of DTIC resources had saved their projects a total of over $502,508 during the past year. If equivalent time and dollar savings are realized by even one-fourth of the Army's R&D personnel, it appears safe to estimate that the direct savings accrued to Army R&D from DTIC use may be as much as $40 to $50 million per year.

DROLS Saves Time Required to Locate Information

10. The Defense R&D On-Line System (DROLS) permits rapid search of 1.3 million document citations in the DTIC data bases. Some libraries use DROLS to catalog their own in-house technical reports collections, thereby saving the time needed for manual cataloging.

Thorough and Accurate Indexing of Technical Reports is Vital

11. Accurate and comprehensive use of subject terms to represent the content of a referenced technical report facilitates its retrieval from the data base. If subject terms are inaccurate or incomplete, documents containing valuable information may not be located.

Army Input to DTIC Is Vital

12. Army R&D organizations must promptly submit technical reports, translations of technical documents from foreign languages, and Work Unit Summaries to DTIC to keep the data bases current, comprehensive, and useful.

Constraints on DTIC Capabilities

13. Army technical information specialists recognize several factors that limit DTIC's capabilities, all of which are well known to DTIC:

1. Budget constraints inhibit procurement of needed personnel and equipment.

2. The large volume of document requests and dependance on the mail for distribution of hard-copy documents delay response time.

3. The DDC Retrieval and Indexing Terminology (DRIT) document is outdated. 2/

4. Paper documents reproduced from microfiche and microfilm are sometimes difficult to read.

SPECIFIC FINDINGS AND RECOMMENDATIONS

Finding and Recommendation Number 1

14. **Finding.** About 800 of the 3,200 Army R&D scientists and engineers who responded to the survey do not use DTIC resources and services because they are not aware that DTIC exists.

15. **Recommendation.** All levels of Army R&D management and the technical libraries should expand their efforts to ensure that scientists and engineers are oriented on availability and benefits of DTIC resources and are required to search DTIC data bases for work already done before undertaking or sponsoring new R&D projects.

Finding and Recommendation Number 2

16. **Finding.** Army R&D organizations are not fully contributing technical reports, Work Unit Summaries, and other technical literature to the DTIC data collection.

17. **Recommendation.** Headquarters, Department of the Army (HQDA), and the major commands should amplify their supervision of the R&D centers and laboratories to ensure that S&T materials of interest to the Army and Defense R&D Community are submitted to DTIC.

Finding and Recommendation Number 3

18. **Finding.** The Army can reduce time required for its DTIC users to receive paper and microfiche copies of DTIC reports, bibliographies, and Work Unit Summaries.

19. **Recommendation.** HQDA and the major R&D commands should instruct the centers and laboratories to investigate the costs and benefits of upgrading their equipment for interface with DROLS and procuring equipment with improved printing capability and adequate equipment for production of paper copies from microfiche.

2/ The former name of DTIC was the "Defense Documentation Center."

Finding and Recommendation Number 4

20. **Finding.** Only 2% of the Army R&D scientists and engineers use the DTIC Current Awareness Bibliography (CAB) services to learn of new acquisitions to the Technical Reports Data Base.

21. **Recommendation.** Laboratory management and the technical libraries should ensure that all R&D scientists and engineers are informed about the DTIC CAB and know local procedures for establishing their own CAB profile.

Finding and Recommendation Number 5

22. **Finding.** The Army can help improve the retrievability of technical reports in the DTIC collection.

23. **Recommendations.** (1) Managers in the R&D centers and laboratories should ensure that technical report authors properly fill out block 18, "Subject Terms" of DD Form 1473. (2) Each R&D center and laboratory library not currently participating in the Shared Bibliographic Input Network (SBIN) should do so.

Finding and Recommendation Number 6

24. **Finding.** R&D scientists and engineers and library personnel need to work together to structure strategies for search of DTIC data bases.

25. **Recommendation.** R&D centers and laboratories should sponsor training on information search procedures for the scientists and engineers, with emphasis on the particular techniques found useful by the local technical library.

CONCLUSION

26. DTIC information resources and services have the potential to contribute greatly to the Army's R&D program. Army R&D Community managers, scientists and engineers, and information specialists all have equal and joint responsibility to ensure that these resources and services are used and supported.

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ORGANIZATIONAL ACRONYMS

Throughout this report mention is made of Army organizations. For ease of reference, acronyms for the R&D commands, laboratories, and centers are often used in place of their full names. The acronyms for the organizations mentioned are presented below:

Organization Name	Acronym
Army Materiel Command	AMC
Army Research Office	ARO
Ballistic Research Laboratory	BRL
Human Engineering Laboratory	HEL
Materials & Mechanics Research Center	MMRC
Aviation Systems Command	AVSCOM
Aviation R&T Laboratories	RTL
Aeromechanics Laboratory	AL
Applied Technology Laboratory	ATL
Aviation Engineering Flight Activity	AEFA
Armament, Munitions and Chemical Command	AMCCOM
Armament Research & Development Center	ARDC
Fire Control and Small Caliber Weapon Systems Laboratory	FSL
Large Caliber Weapon Systems Laboratory	LCWSL
Chemical Research & Development Center	CRDC
Communications Electronics Command	CECOM
Electronics Research and Development Command	ERADCOM
Atmospheric Sciences Laboratory	ASL
Combat Surveillance and Target Acquisition Laboratory	CSTAL
Electronics Technology and Devices Laboratory	ETDL
Electronic Warfare Laboratory	EWL
Harry Diamond Laboratories	HDL

ORGANIZATIONAL ACRONYMS (Cont)

Organization Name	Acronym
Night-Vision and Electro-Optics Laboratory	NVEOL
Army Missile Command	MICOM
Army Missile Laboratory	AML
Tank-Automotive Command	TACOM
Troop Support Command	TROSCOM
Belvoir R&D Center	BRDC
Natick R&D Center	NRDC
Chief of Engineers	COE
Cold Regions Research & Engineering Laboratory	CRREL
Army Research Institute for the Behavioral and Social Sciences	ARI
Office of the Surgeon General	OTSG
Medical Research and Development Command	MED R&D CMND
Aeromedical Research Laboratory	ARL
Letterman Army Institute of Research	LAIR
Medical Bioengineering R&D Laboratory	BRDL
Medical Research Institute of Chemical Defense	MRICD
Medical Research Institute of Infectious Diseases	MRIID
Walter Reed Army Institute of Research	WRAIR

I. INTRODUCTION

PURPOSE OF THE STUDY

1.1. This analysis of the use of the Defense Technical Information Center (DTIC) resources by scientists and engineers in Army Research and Development (R&D) centers and laboratories was conducted to assist U.S. Army Materiel Command (AMC) management in evaluating and enhancing the effectiveness of Army use of DTIC information resources and services. The study sponsor was the Principal Army Technical Information Officer, Office of the Deputy Chief of Staff for Technology Planning and Management (AMCLD), Headquarters, AMC. Presearch Incorporated conducted the study during the period September 1984 through September 1985 under Contract No. DAAD05-84-C-0189.

PROBLEM

1.2. Indications of low-level or inadequate use of DTIC by R&D scientists and engineers have been mentioned in recent DoD Inspector General and Government Accounting Office reviews. The Office of the Deputy Chief of Staff for Technology Planning and Management has insufficient hard data about the extent to which bench-level scientists and engineers in the AMC R&D centers and laboratories use DTIC information and services, the procedures they use to obtain it, and the benefits Army R&D gains from its use of DTIC resources. Without adequate data, Headquarters, AMC is limited in the extent to which it can assure effective communication of technical information and assist technology transfer in fulfillment of its responsibility to "coordinate administration and execution of the STIP" (Scientific and Technical Information Program, ref. AR 70-45, Section II, 11).

ORGANIZATION AND CONTENT OF THE REPORT

1.3. This report includes seven sections:

a. **Section I. Introduction**--Covers the study's purpose and problem, the organization of the report, background information on DTIC and Army R&D activities, the study's scope and constraints, terms and acronyms, and references.

b. **Section II. Methodology**--Explains the study's planned methodology and describes modifications made as the work progressed.

c. **Section III. Characteristics of the Army R&D Laboratories**--Describes the organization of the Army R&D laboratories and their information requirements. Characteristics of the scientific and technical (S&T) libraries and information centers supporting the R&D laboratories are included.

d. **Section IV. DTIC Services and Information Resources**--Discusses the DoD Scientific and Technical Information Program (STIP), the role of DTIC in the STIP, DTIC information resources and services, and constraints on DTIC's capabilities.

e. **Section V. Use of DTIC Resources by S&T Libraries and Information Offices**--Discusses administration and response of the library survey, requirements for use of DTIC information, library resources and procedures for processing DTIC information, the benefits for R&D from use of DTIC resources, and library comments.

f. **Section VI. Use of DTIC Resources by R&D Scientists and Engineers**--Discusses the administration and response of the Phase I and Phase II surveys of scientists and engineers, the extent of DTIC use by bench-level R&D scientists and engineers, their evaluation of DTIC resources, and the benefits they realize from DTIC use.

g. **Section VII. Observations, Findings, and Recommendations**--Summarizes the study's observations and findings and makes recommendations for consideration by Headquarters, AMC.

The following appendices supplement the basic report:

a. Appendix A--Acronyms

b. Appendix B--Bibliography

c. Appendix C--Study Plan

d. Appendix D--Survey Materials for Scientific and Technical Libraries and Information Centers

e. Appendix E--Survey Materials for Bench-level Scientists and Engineers at the R&D Laboratories

f. Appendix F--Individual Library Survey Data

g. Appendix G--End-User Survey Data and Comments

BACKGROUND

1.4. There are 35 U.S. Army R&D centers and laboratories that have been recognized by the Army as in-house laboratories. 1/ These organizations range in size from under 100 to over 1,000 scientists and engineers and are found within the Army Materiel Command and the Army Medical Research and Development Command, or are supervised directly by the Chief of Engineers or the Deputy Chief of Staff for Personnel on the Headquarters, Department of the Army (HQDA) staff. The laboratories perform basic

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1/ These 35 organizations meet the requirement of having a $20 million or more R&D budget and were officially designated "laboratories" in a HQDA letter from the Office of the Deputy Chief of Staff for Research, Development, and Acquisition (DAMA-ARZ), Subj: Establishment of Army Offices of Research and Technology Application (ORTA) in Accordance with Stevenson-Wydler Act of 1980 (PL 96-480), 8 January 1982.

and applied research in support of Army and Department of Defense (DoD) materiel, medical, engineering, and personnel development programs. Most activities and research projects of the laboratories are documented in Work Unit Information Summaries (DD Forms 1498) and technical reports that are submitted to DTIC. DTIC is the DoD central repository for these and other documents, which are then made available to the DoD R&D community and the contractors, universities, and research institutions that are authorized to use DTIC.

1.5. In addition to being important suppliers of reports for DTIC, the laboratories are DTIC users and are supported by DTIC services and resources. These services include operation of automated data bases, maintenance of current awareness services to inform users about new DTIC document acquisitions, and storage of documents in microform for retrieval as required by DTIC users. The data bases are accessible to DTIC users through the Defense R&D On-Line System (DROLS) or by direct contact with DTIC. Through DROLS, users with remote terminals may search the DTIC data bases for information and request copies of documents that are referenced in the data bases.

1.6. In almost all cases, scientists and engineers in the Army laboratories depend on the staffs of their supporting technical libraries to obtain information from DTIC on their behalf. In many cases, this assistance includes the services of technical information specialists who use DROLS to search the DTIC data bases for information and/or references. The libraries and information centers help scientists and engineers in defining their information requirements vis-a-vis the DTIC information resources. In this way, the libraries and information offices act as a bridge between the R&D scientists and engineers and DTIC.

SCOPE OF THE STUDY

1.7. This study of the use of DTIC information and resources by Army R&D centers and laboratories included 29 of the major laboratories involved in Army R&D activities. Table 1-1 lists the laboratories and centers to which survey materials were forwarded. Surveys were made of the S&T libraries supporting these organizations and their "bench-level" scientists and engineers, who are the end users of DTIC information. The time available for the study did not permit survey of the AMC project/product management offices.

CONSTRAINTS

1.8. The major constraints within which the analysis was conducted are listed below:

a. Available time and resources did not permit survey of all of the Army laboratories.

b. The scope of the analysis did not permit extensive follow-up with the survey respondents or interview of representatives of all R&D laboratories and centers.

c. Certain limitations in the available R&D documentation required some changes in the planned study methodology (see Section II).

TERMS AND ACRONYMS

1.9. Terms and acronyms are explained the first time they appear in the text of this report. Appendix A contains a complete list of all acronyms in this report. The acronyms for commands and R&D laboratories and centers are provided at the front of this report.

TABLE 1.1
LIST OF R&D LABORATORIES/CENTERS STUDIED

Applied Technology Lab

HQ Aviation R&T Labs and Aeromechanics Lab

Aviation Engineering Flight Activity

Chemical Research and Development Center (CRDC)

Fire Control and Small Caliber Weapons Systems Lab

Large Caliber Weapons Systems Lab

Communications-Electronics Command R&D Center

Atmospheric Sciences Lab

Combat Surveillance and Target Acquisition Lab

Electronics Technology and Devices Lab

Electronics Warfare Lab

Harry Diamond Labs

Night-Vision and Electro-Optics Lab

Army Research Office

Ballistic Research Lab

Human Engineering Lab

Materials and Mechanics Research Center

Army Missile Lab

Tank-Automotive Lab

Belvoir R&D Center

Natick R&D Center

Cold Regions Research and Engineering Lab

Research Institute for the Behavioral and Social Sciences

Aeromedical Research Lab

Letterman Army Institute of Research

Medical Bioengineering R&D Lab

Medical Research Institute of Chemical Defense

Medical Research Institute of Infectious Diseases

Walter Reed Army Institute of Research

REFERENCES

1.10. Appendix B contains a bibliography of documents pertaining to R&D and the use of DTIC information and resources by scientists and engineers in the Army R&D centers and laboratories. The documents listed below are the most important of these references in regard to this analysis of the Army R&D Community's use of DTIC.

a. AR 70-9, Army Research Information Systems and Reports, 1 May 1981.

b. AR 70-45, Scientific and Technical Information Program, with Appendix A, DoD Scientific and Technical Information Program; Appendix B, Section 102, Public Law 94-282; and Appendix C, Section 11, Public Law 96-480, 1 January 1984.

c. Defense Technical Information Center, Users' Guide to Defense Technical Information Center Programs, Products, and Services, July 1980.

d. Defense Technical Information Center, DTIC 2000: A Corporate Plan for the Future, AD-A 143 900 DTIC/TR-84/3, July 1984.

e. U.S. Army Materiel Command, Department of Defense In-House RDTE Activities, Alexandria, VA, 30 October 1983.

f. Department of the Army, Compendium of Key Field Activity Scientific and Technical Capabilities, January 1984.

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II. METHODOLOGY

CONTENT AND ORGANIZATION

2.1. This section describes the technical approach used to collect and analyze data about the use of DTIC information and resources by scientists and engineers in the Army R&D centers and laboratories. It is divided into two subsections:

a. Planned Methodology--summarizes the study approach published in the study plan, which was based on the contract statement of work. The complete study plan is contained in Appendix C.

b. Modifications to Planned Methodology--describes the approach that evolved during the course of the study as various factors encountered dictated changes in the original plan.

PLANNED METHODOLOGY

Original Concept

2.2. The original concept for the study was to focus on use of DTIC services by R&D centers and laboratories within AMC. The study investigators planned to identify end-users and to quantify the extent to which they use DTIC data resources. Once the extent of DTIC use had been determined and specific end users had been identified, selected end users and the S&T libraries were to be surveyed to determine the benefits of DTIC information and services to the Army R&D process.

Study Tasks

2.3. Based on the study concept, the following specific tasks were identified:

a. **Task 1: Plan**--refinement of the methodology in the statement of work, scheduling of project activities and allocation of effort, and preparation of the study plan.

b. **Task 2: Conduct Initial Research**--study of DTIC procedures, data base content, and DROLS operation; research of directives and regulations concerning the Army STIP; and identification of data to be collected.

c. **Task 3: Collect Data**--collection of information from R&D libraries and scientists and engineers. It included development, review, and testing of interview schedules and questionnaires, conduct of surveys, and collection and automation of survey data.

d. **Task 4: Analyze Data**--analysis of the data to develop findings and recommendations.

e. **Task 5: Prepare Report**--documentation of study findings in a technical report to the study sponsor and other interested parties.

MODIFICATIONS TO PLANNED METHODOLOGY

2.4. The study began in accordance with the planned methodology. However, during the initial investigation and preparation for conduct of the survey, unforeseen factors developed that required some adjustment of the original methodology. The most important of these concerned the initial identification of the DTIC end-user population. The following paragraphs describe these factors and discuss their effects on the study methodology.

Insufficient Data to Identify DTIC End-User Population

2.5. The investigators originally expected that the DTIC end-user population within the AMC R&D centers and laboratories could be identified through information available from DTIC and/or the R&D commands and laboratories. Initial investigation of data maintained by DTIC and the R&D laboratories revealed that there were little or no data available from DTIC or AMC at the command or laboratory level that would facilitate a reasonably accurate identification of the DTIC end-user population within the laboratories. Even the technical libraries and information offices supporting the labs had incomplete information about which of their customers were DTIC end users. Consequently, it became necessary to develop another method of identifying the DTIC end-user population in the R&D centers and laboratories.

2.6. The method developed to identify the R&D scientists and engineers who were DTIC end users required that the end-user survey (originally a plan to ask selected scientists and engineers to complete a questionnaire) be conducted in two phases. During Phase I, brief, one-page questionnaires were sent to all of the scientists and engineers in the selected laboratories asking each individual if he or she used DTIC and if its information and services were valuable.

2.7. Once the Phase I survey results were processed and those who used DTIC resources were identified, Phase II questionnaires were to be sent to those respondents who placed a high value on DTIC to obtain detailed information on the benefits of DTIC information and services to their work. In the original plan, librarians and/or technical information specialists were also to be surveyed by questionnaire to obtain information on library

procedures and processing of DTIC information and on the value of DTIC resources as perceived by library personnel.

Expansion of Sample Population

2.8. When the revised survey methodology and materials were presented to the project sponsor for review and comment, he expressed his wish to include in the survey not only the AMC R&D centers and laboratories but all of the Army laboratories, or at least a representative laboratory, from other elements of the Army R&D Community. The survey distribution lists were then modified to include at least one laboratory from the Corps of Engineers, the Medical R&D Command, and the HQDA Office of the Deputy Chief of Staff for Personnel.

Revised Tasks

2.9. The following tasks were actually completed during the course of the study:

a. **Task 1: Plan**--refinement of the methodology in the statement of work, scheduling of project activities and allocation of effort, and preparation of the study plan. The study plan was published on 29 November 1984.

b. **Task 2: Conduct Initial Research**--study of DTIC data bases, services, operating procedures, and the DROLS at the DTIC facility in Alexandria, Virginia; review of previous studies about DTIC and its services; review of pertinent DoD Army directives and regulations concerning the STIP; and identification of data to be collected through interview of selected librarians. This task was mainly completed in January 1985.

c. **Task 3: Prepare Survey Materials**--preparation of survey questionnaires for the S&T libraries and DTIC end users. Preparation and testing of these questionnaires were accomplished with assistance

from library staff and selected scientists and engineers at BRL, Harry Diamond Laboratories, the Redstone Scientific Information Center, and CRDC. Questionnaire preparation was completed in March 1985. Survey materials for the libraries are included in Appendix D; survey materials for scientists and engineers are in Appendix E.

d. **Task 4: Collect Data.** The Phase I questionnaires for the S&T libraries and the general R&D scientist and engineer population were mailed from HQAMC on 26 March 1985 with a suspense date for completion by 26 April 1985. The data from the general end-user survey were automated and processed during May and June to identify the individual scientists and engineers to be questioned during Phase II. The Phase II questionnaires were mailed on 1 July to 247 of the scientists and engineers located throughout the R&D laboratories who responded to the Phase I survey. All survey data were received by mid-August.

e. **Task 5: Data Analysis.** The Phase I and Phase II end-user survey data were automated and processed using the Statistical Program for the Social Sciences for Personal Computers (SPSS/PC) software package on a micro-computer. The survey data from the libraries were processed manually. Data interpretation and analysis were mainly conducted during June for the Phase I surveys and during August and September for the Phase II survey.

f. **Task 6: Report Preparation.** This study report was written during September and early October 1985.

Involvement of DTIC, the Contracting Officer's Representative, and the Study Sponsor

2.10. Throughout the course of this study, DTIC, the Contracting Officer's Representative (COR), the Study Sponsor, and other Army personnel were active participants in the effort. Major areas of their participation include assistance in detailed

planning, provision of access to DTIC statistics and other information as well as training on the DROLS, preparation of correspondence, review and distribution of survey materials, and review of survey results.

III. CHARACTERISTICS OF THE ARMY R&D LABORATORIES

CONTENT AND ORGANIZATION

3.1. This section briefly describes the organization of the Army R&D centers and laboratories, the types of scientific and technical (S&T) activities in which they are engaged, and their information requirements. It includes the following subsections:

a. Organization of the Army R&D Laboratories--describes the Army R&D laboratory organizational relationships and the typical organizational structure of an R&D laboratory.

b. Laboratory Information Requirements--describes the information requirements of the laboratories, in general, and provides brief descriptions of the specific S&T areas and activities in which each laboratory included in the study is involved.

c. Characteristics of S&T Libraries and Information Centers Supporting Army R&D Laboratories--describes the organization, principal functions, and resources of the S&T libraries and information centers supporting the Army R&D laboratories.

ORGANIZATION OF THE ARMY R&D LABORATORIES

Army R&D Laboratory Organizational Relationships

3.2. The 35 Army laboratories constitute a large investment of dollars and manpower and perform work in a very broad range of research and development activities. Altogether they employ over 26,000 people (military and civilian), of which approximately 10,000 are scientists and engineers engaged in R&D

activities. These laboratories have an annual R&D budget of about $1.5 billion dollars.

3.3. The Army R&D laboratories are managed either directly or indirectly by one of the following HQDA staff agencies: (1) the Office of the Deputy Chief of Staff for Research, Development, and Acquisition (ODCSRDA), (2) the Office of the Deputy Chief of Staff for Personnel (ODCSPER), (3) the Office of the Surgeon General (OTSG), and (4) the Chief of Engineers (COE). ODCSRDA provides staff guidance for R&D matters over AMC, which includes 20 laboratories and R&D centers. The Surgeon General manages the Medical R&D Command, which includes 9 laboratories (or institutes), and the Chief of Engineers manages 4 (formerly 5) laboratories. ODCSPER manages the Army Research Institute for the Behavioral and Social Sciences. The organizational relationships of the elements of the Army R&D Community at the time of the study are shown in Figure 3.1. Figure 3.2 shows the organization as of 1 October 1985 with the changes shown in italics. ERADCOM has been disestablished and a new Laboratory Command (LABCOM) established. The Materials and Mechanics Research Center has been redesignated as the "Army Materials Technology Laboratory."

Organizational Structure of R&D Laboratories

3.4. Army R&D laboratories have generally similar organizational structures. Figure 3.3 illustrates the organization of a typical Army R&D laboratory. As shown in the figure, the laboratory is headed by either a director or a commander. Directly subordinate to the director/commander are several R&D divisions organized along functional or technology lines, a technical information office, and an administrative support division. Subordinate to each R&D division may be two or more branches

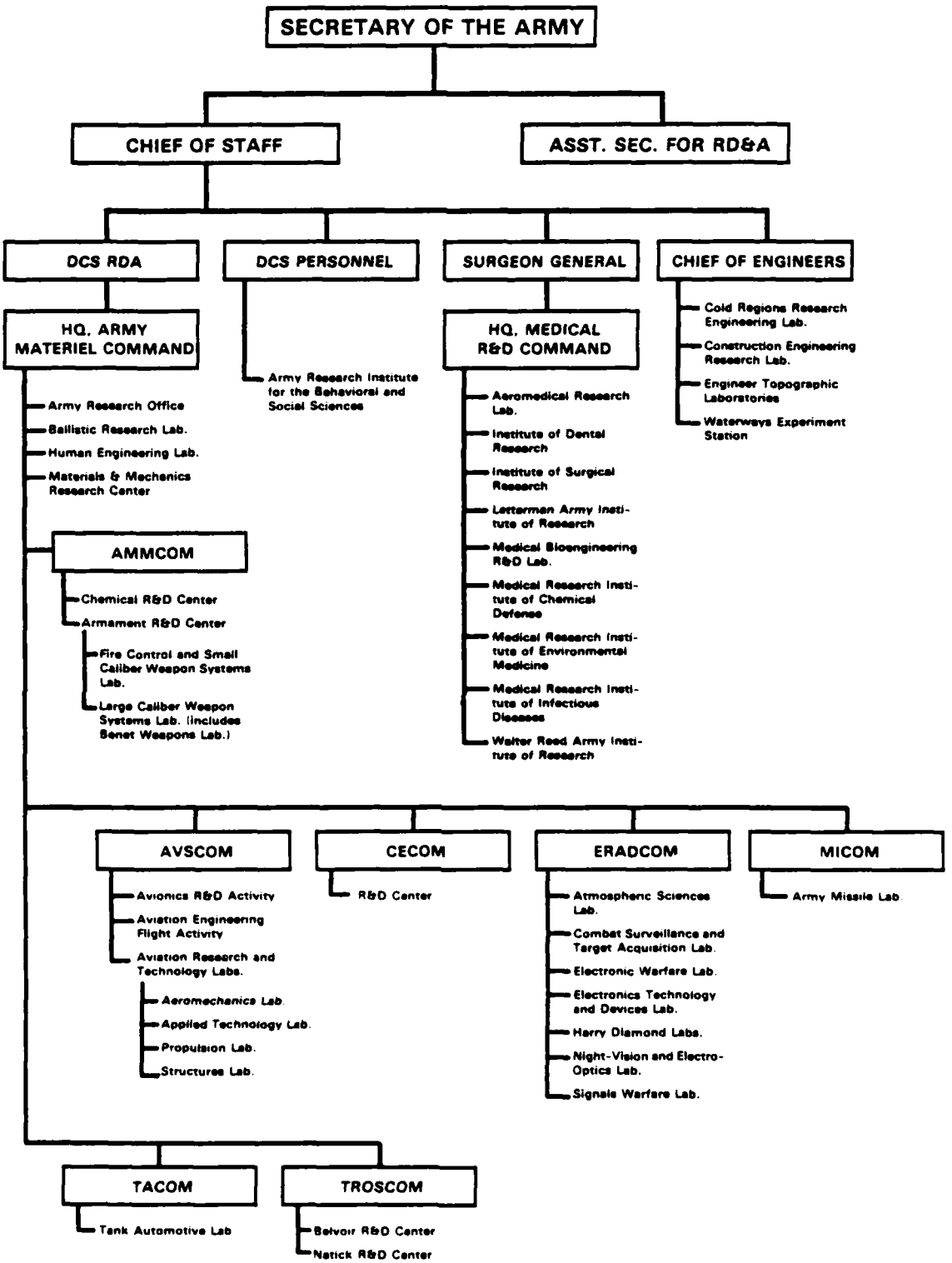

FIGURE 3.1. Organization of Army Laboratories Prior to 1 October 1985

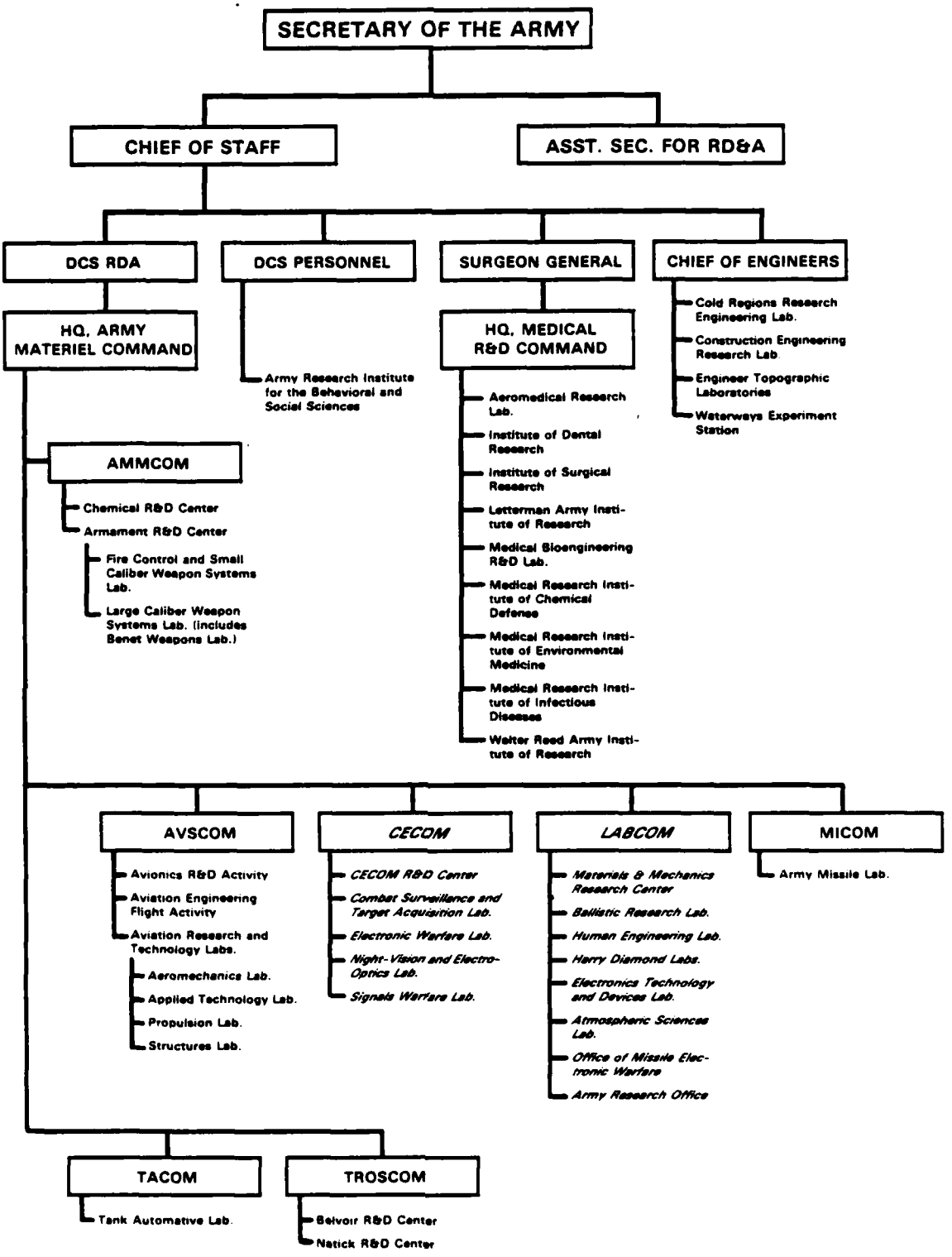

FIGURE 3.2. Reorganization of Army Laboratories as of 1 October 1985

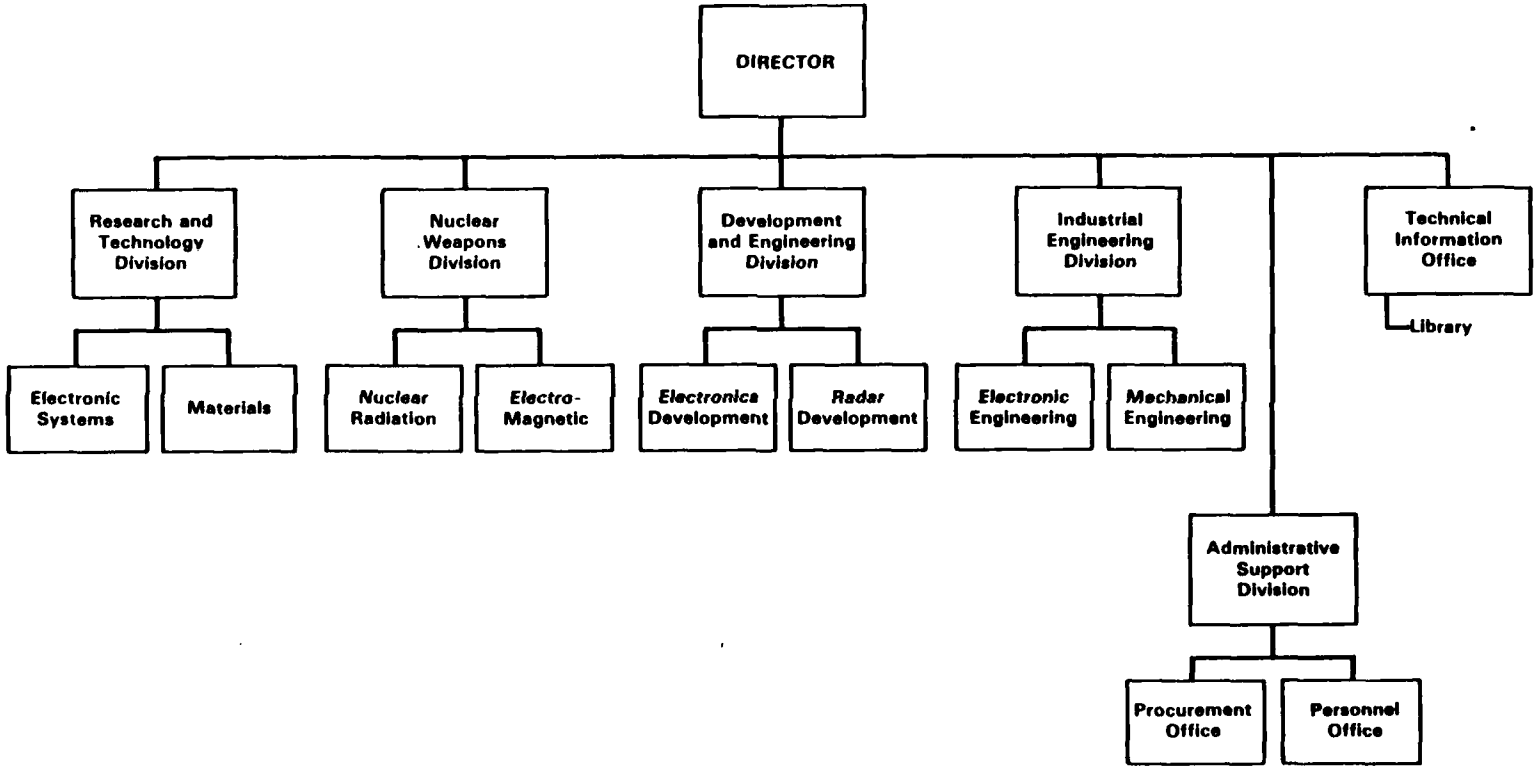

FIGURE 3.3. Organization Chart of a Typical Laboratory

that work in specific S&T areas. Depending on the organization, these elements may be further subdivided. The technical information office includes a technical library in most cases.

3.5. The R&D activities conducted by the laboratories are primarily concerned with the 6.1 and 6.2 program categories of the Army RDTE program. The 6.1 category designates Basic Research, which involves developing increasing knowledge and understanding in scientific fields related to national security. The 6.2 category designates Exploratory Development, which involves applied research and technology directed toward solving specific military problems for the purpose of developing and evaluating proposed solutions and defining their parameters.

LABORATORY INFORMATION REQUIREMENTS

3.6. All R&D laboratories need access to a wide range of S&T information to support their activities. Individually, each laboratory requires information relevant to the particular programs and functions supported by the laboratory's principal mission. The primary programs and S&T areas of interest dictating the specific information requirements of each laboratory included in the study are summarized in Table 3.1.

3.7. As suggested by the table, the information needs of the Army laboratories are quite extensive. To support these needs, the laboratories rely on a variety of information resources, such as automated on-line data bases, proceedings from technical conferences and symposia, technical reports, and S&T books and journals. These resources are normally managed and provided to scientists and engineers by the S&T library or information office.

TABLE 3.1

S&T AREAS OF SPECIALIZATION OF LABORATORIES INCLUDED IN THE STUDY 1/

Laboratory	S&T Area of Specialization
Army Research Office	Chemical-biological, physics, engineering, mathematics, geosciences, metallurgy-materials, electronics
Ballistic Research Lab	Ballistic, charged particle beam, and liquid propulsion technologies
Human Engineering Lab	Human factors engineering including automation, artificial intelligence, and robotics
Materials and Mechanics Research Center	Materials, solid mechanics, & materials testing technology
Chemical Research and Development Center	Neuro-biochemical research; life-cycle engineering for chemical weapons and chemical biological defense; smoke/obscurant technology
Fire Control and Small Caliber Weapons Systems Lab	Fire control and weapons systems technology, ammunition and auxiliary items through 40 mm. caliber
Large Caliber Weapons System Lab	Weapons systems, guns, ammunition larger than 40 mm for tanks, artillery, mortar, and recoilless guns
Applied Technology Lab	Aircraft weaponization and mission support technology
Aviation Engineering Flight Activity	Airworthiness and aircraft performance testing
Aviation R&T Labs	Aeronautical research
Communications-Electronics Command R&D Center	Tactical command, control and communication, military computer equipment and systems and computer software
Atmospheric Sciences Lab	Atmospheric sciences including atmospheric sensing/effects and meteorological technology
Combat Surveillance and Target Acquisition Lab	Radiological systems and radar technology
Electronics Technology and Devices Lab	Electronics technology
Electronics Warfare Lab	Electronic counter-countermeasures technology
Harry Diamond Labs	Electronic fuzes, nuclear weapons effects, and radar technology

TABLE 3.1 (Cont)

Laboratory	S&T Area of Specialization
Night-Vision and Electro-Optics Lab	Electro-optics, lasers, visionics, and infrared technology
Army Missile Lab	Missile technology
Tank-Automotive Lab	Tank-automotive weapons and equipment systems technology
Belvoir R&D Center	Mobility/counter-mobility research and engineering
Natick R&D Center	Aero-mechanical engineering, tool engineering, individual protection, and science and advanced technology
Cold Regions Research and Engineering Lab	Winter and arctic cold conditions research and engineering
Research Institute for the Behaviorial and Social Sciences	Manpower, personnel, training and system research
Aeromedical Research Lab	Life sciences research on effects of aviation, combat vehicles, and combat weapons systems
Letterman Army Institute of Research	Medical research in physiology and other clinical areas
Medical Bioengineering R&D Lab	Medical research on dental materiel, pest management materiel, delivery systems for insecticide, and soldier occupational hazards
Medical Research Institute of Chemical Defense	Basic and medical research on chemical warfare agents, antidote drugs, and pretreatment
Medical Research Institute of Infectious Diseases	Medical research on pathogenesis, diagnosis, prophylaxis, treatment and epidemiology of naturally occuring infectious diseases
Walter Reed Army Institute of Research	Medical research in drug development, neuropsy, general and preventive medicine

1/ Information on the individual laboratories S&T areas of specialization was taken from Headquarters, U.S. Army Materiel Development and Readiness Command, Department of Defense In-House RDT&E Activities: Management Analysis Report, Alexandria, VA, 30 October 1983.

CHARACTERISTICS OF S&T LIBRARIES AND INFORMATION OFFICES SUPPORTING ARMY R&D LABORATORIES

3.8. The Army R&D laboratories are provided information support by a technical information office and/or library located within either the laboratory itself, another nearby laboratory, or a department of the command. Of the 29 laboratories included in this study, 25 had their own libraries.

3.9. In addition to maintaining conventional repositories of paper and microform documents, the technical libraries access automated information services and systems using remote computer terminals operated by the library staff. All the libraries in the Army R&D Community use DTIC services and resources, and most of them maintain terminals for access to the Defense R&D On-Line System (DROLS). One or more technical information specialists on the library staff usually spend all or most of their time involved with use of DTIC and operation of DROLS terminals. These terminals are used primarily for search of the DTIC data bases and information retrieval. They may also be used for on-line entry of Work Unit Information Summaries into the DTIC WUIS data base and for indexing and cataloging. Section IV provides more detailed information about DTIC services and resources used by the technical libraries at the Army R&D laboratories.

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IV. DTIC SERVICES AND INFORMATION RESOURCES

CONTENT AND ORGANIZATION

4.1. This section describes the role of DTIC in the DoD Scientific and Technical Information Program and the services and information resources DTIC provides to the Army and other DoD components. This information provides a frame of reference for assessing the extent to which Army R&D elements are realizing the potential benefits to be derived from use of DTIC resources. The section includes the following subsections:

a. The DoD STIP

b. The DTIC Role in the STIP

c. DTIC Information Resources and Services

d. Constraints on DTIC's Capabilities.

THE DoD STIP

4.2. DoD Directive 3200.12, DoD Scientific and Technical Information Program, dated 15 February 1983, defines concepts and assigns responsibilities for the operation and management of the DoD STIP. It also assigns the mission, responsibilities, and functions of DTIC. This DoD directive is supplemented by Army Regulation (AR) 70-45, Scientific and Technical Information Program, dated 1 February 1984.

4.3. The objectives of the STIP are to ensure that S&T information generated by research and engineering (R&E) programs provide maximum contribution to the advancement of science and technology; permit timely, effective, and efficient conduct of

DoD R&E programs; provide information support to the management of R&E-related programs; and eliminate unnecessary duplication of effort and resources by encouraging and expediting the interchange and use of S&T information. [1] The Under Secretary of Defense for Research and Engineering is the proponent for this directive and is responsible for overall policy direction and coordination of the STIP.

4.4. The STIP provides for the availability and effective exchange of S&T information to support DoD R&E activities and promotes activities devoted to the collection, analysis, evaluation, storage retrieval, and dissemination of S&T information. The STIP does not include DoD S&T Intelligence; however, it does charge the Under Secretary to coordinate with DoD, Army, and other national intelligence agencies to effect transmittal of relevant information and translations derived from technical intelligence activities to DTIC and DoD Information Analysis Centers. [2]

DTIC ROLE IN THE STIP

4.5. DTIC is the central clearinghouse for the Department of Defense's collections of research and development documents in nearly all fields of science and technology. It contributes to the management and conduct of DoD R&D efforts by providing access to and transfer of S&T information for DoD personnel, defense contractors and potential contractors, and other U.S. Government agency personnel and their contractors. DoD Directive 3200.12 charges DTIC with a variety of missions in

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[1] DoD Directive 3200.12, Encl 4, paragraph 8.

[2] Ibid., Encl 2, Section C, paragraph 1m.

support of the DoD STIP. These missions include the operation of DoD-wide S&T information systems, the provision of a central coordination point for DoD S&T data bases and systems, and the provision of technical information support services. Another DTIC responsibility particularly relevant to the current study is its mission to provide centralized technical support to DoD technical libraries by applying automation, establishing networks, and sharing resources.

DTIC INFORMATION RESOURCES AND SERVICES

4.6. DTIC conducts three major categories of activities that are of direct interest to Army R&D organizations: (1) the acquisition of technical reports and other R&D-related documents; (2) document storage; and (3) dissemination of documents. Dissemination of information is accomplished both at the initiative of DTIC, through publication of accession announcements and operation of current awareness services, and at the initiative of DTIC users who search DTIC's holdings and request documents and bibliographies from DTIC.

4.7. The central functions of DTIC involve the maintenance of the DoD Technical Report Collection, the operation of four data bases, and the operation of the Defense R&D On-Line System, an automated information network. DTIC users employ DROLS terminals to search the data bases for and retrieve information, and may, in some cases, use DROLS to provide information to be included in the data bases. The four DTIC data bases are as follows: The Technical Report Data Base, The Research and Technology (R&T) Work Unit Information System, The Independent R&D Data Base, and the R&D Development Program Planning Data Base.

The Technical Reports Collection and Data Base

4.8. The heads of DoD components are required by DoD Directive 3200.12 to ensure that all significant S&T observations, findings, recommendations, and results derived from DoD endeavors (including those generated under grants or contracts that are pertinent to the DoD mission or contribute to the DoD or national S&T data base) are recorded as technical reports. These documents are to be made available to the DoD R&E community, including DTIC, supporting technical libraries, and the Information Analysis Centers, as appropriate.

4.9. Since its establishment, DTIC has collected almost 1.6 million technical reports, all of which have been recorded in microform. Reports collected by DTIC prior to August 1965 were recorded in microfilm; after that date DTIC began using microfiche to record reports. Of these 1.6 million documents, approximately 1.3 million are under automated control and 0.3 million of the early documents are manually catalogued. [3/] The collection includes documents at the UNCLASSIFIED, CONFIDENTIAL, and SECRET levels of classification. [4/] DTIC also observes any restrictions on document distribution that may be required by the originator, such as limitation to DoD use or to U.S. Government use. Documents with no restrictions on their distribution are made available to the U.S. National Technical Information Service for sale to the public. The Technical Report Collection includes many other types of documents of interest to the DoD R&D Community in addition to reports of U.S. R&D

3/ DTIC Information Packet, June 1983.

4/ Originating agencies send documents classified TOP SECRET directly to the National Security Agency for storage.

projects. For example, the collection includes well over 50,000 translations of S&T articles, books, and reports published by foreign countries.

4.10. The 1.3 million technical reports under automated control are referenced in the DTIC Technical Report Data Base. The data base record for each document is prepared based on information provided on DoD Form 1473, Report Documentation Page, completed by the document originator. By regulation, DoD Form 1473 is the first page below the cover of every submitted document. The Form 1473 includes a bibliographic citation, various subject terms which indicate the content of the document, and a brief abstract. The DTIC user who accesses the data base through DROLS may search for documents using almost any of the information items maintained in the data records, either information about the document such as author, publisher, date of publication, and title; descriptive words used as subject terms; or words that appear in the abstract.

4.11. Major purposes of the Technical Report Collection and Data Base are to provide DoD R&D personnel access to information about the technology available to the Government and to avoid duplication of effort. R&D scientists and engineers are instructed to search the Technical Report Data Base at the initiation of new projects, both to obtain technical information and to ensure that the contemplated project will not be a duplication of effort.

The R&T Work Unit Information System

4.12. The R&T Work Unit Information System (WUIS) data base contains summary reports on ongoing R&T projects being carried out by DoD organizations and their contractors. AR 70-9

requires R&T work unit leaders to fill out the R&T Work Unit Information Summary, DD Form 1498, at the initiation of the work, update it annually, or at a lesser interval if a significant change occurs, and at the completion of the work. These summaries are maintained in the active WUIS on DROLS while the work is in progress. After completion of the work, the summaries are retained in an inactive data base stored off-line.

4.13. The user of the R&T WUIS data base can readily identify most areas of activity currently being conducted by DoD R&D organizations and who is involved in these activities. The availability of this information helps reduce the amount of work duplicated by various components of the large and widespread DoD R&D establishment.

The Independent R&D Data Base

4.14. The Independent R&D (IR&D) data base contains information submitted by DoD contractors about research programs they are conducting on their own initiative. Since much of this information is competition sensitive, it is classified as proprietary information and is released only within the Government. Information for the IR&D data base is supplied on DD Form 271.

4.15. DoD and other Government users of the IR&D data base are able to search its records to determine what efforts being made by contractors have potential use for the military.

The R&D Program Planning Data Base

4.16. The R&D Program Planning data base consists of program planning documentation at the work unit and task level, which forecasts and proposes future research efforts. Collection of

input for this data base was discontinued in January 1983 at DoD's request, but the data base is still available while a replacement is being planned. The form used for collection of information for this data base was DD Form 1664.

The Defense R&D On-Line System

4.17. DTIC users with appropriate computer terminals are able to access the DTIC automated data bases by using DROLS. DROLS includes the DTIC central computer, the remote terminals of the DTIC users, the communication lines connecting the terminals with the central computer, [5/] the software required to operate the system, and the DTIC data bases. The DROLS includes over 550 remote terminals operated by Government agencies, contractors, universities, and research institutes located throughout the U.S. About 40 terminals are operated by Army "in house" R&D organizations. In most cases, the remote DROLS terminals are located in the user organization's technical library and are operated by library staff personnel. DTIC offers both in-house and on-site training for DROLS operators.

4.18. DROLS enables users at remote locations to search for and retrieve information from the DTIC data bases; print out information locally or request printouts from DTIC if local resources for printing are limited; request paper or microfiche copies of documents in the technical reports microform collection; and, in some cases, provide input to the Technical Report and WUIS data bases. Most of the standard bibliographic items such as author, source, date, title, etc., can be searched on-line. Free text

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5/ In many cases the remote terminals are "dial-up" terminals that use commercial telephone lines to communicate with the central computer system.

searching of the narrative fields is available on a limited basis. Nonbibliographic data are also searchable including items such as contracts, projects, report numbers, and funding sources. Depending on whether the user's terminal is hard-wired or uses dial-up access, the user may or may not access both unclassified and classified data. Users of classified information must use dedicated phone lines. Users of unclassified information may use a dial-up terminal and public phone lines.

4.19. **Responsibility for submission of information and reports to DTIC rests with all levels of management within the DoD R&D Community, from the heads of the major DoD components down to individual scientists and engineers at the Task and Work Unit level.** These personnel are responsible for ensuring that the DD Forms 1498 and 1473 are completed and put into proper channels for transmission to DTIC. In most cases these channels include review by management and submission to local library personnel for further processing and submission to DTIC.

4.20. Certain information can be provided to DTIC on-line through use of DROLS. Bibliographic information for technical reports can be provided through the Shared Bibliographic Input Network (SBIN). This network allows DROLS operators at laboratory technical libraries to enter and/or supplement the bibliographic information recorded in the data base record for a technical report. The On-Line Edit (OLE) system permits the entry of WUIS records (from DD Form 1498) on-line. Within the Army, the Automated Information Division of HQAMC manages use of the OLE and supervises submission of 1498s to DTIC.

DTIC Dissemination of Information

4.21. DTIC disseminates information on-line through DROLS, the distribution of paper or microfiche copies of documents, and the provision of bulletins announcing new accessions. DTIC products and services include the Technical Abstract Bulletin (TAB) and indexes, the Automatic Document Distribution (ADD) program, the Current Awareness Bibliographies (CAB), Subject Bibliographies, and Recurring Management Systems Reports. To facilitate use of its services DTIC publishes the DDC Retrieval and Indexing Terminology (DRIT), the DTIC Data Dictionary, the Source Hierarchy Lists, and various users manuals and instructional materials.

4.22. The TAB and companion indexes, which are classified CONFIDENTIAL, are published biweekly to announce the availability of documents newly acquired by DTIC. The TAB and Indexes are distributed without charge to all DTIC users with facility clearances. Based on a user's subject-interest profile, the ADD Program selects newly accessioned reports announced in the TAB and provides automatic distribution of microfiche copies of the reports selected. Like the ADD Program, the CAB matches a user's subject-interest profile biweekly against newly acquired technical reports to provide users with customized automated bibliographies. Subject Bibliographies provide specialized bibliographies and data base summaries on request to specific user requirements.

4.23. The Recurring Management Information Systems Reports provide separate compilations of reports from the Work Unit and Independent Research and Development data bases on a monthly, quarterly, semi-annual, or annual basis, according to formats requested by users. The DRIT provides DTIC's vocabulary for

indexing and retrieval of S&T literature. It supplies a basic multidisciplinary subject term vocabulary to be used not only by DTIC to index and retrieve information from its various data bases but also as an aid to assist DTIC's users in their information storage and retrieval operations.

4.24. To support the dissemination of its information resources, DTIC provides additional services that supplement or enhance the effectiveness of its information products. These other services, which are listed and described below, include the following: (1) the References Service which assists users in identifying and locating technical reports; (2) the Document Services which provide users with microfiche or paper copies of documents when ordered by phone, letter, request form, or through on-line terminals; (3) the Referral Services which supplement the Document Services by referring users to other sources of information and assistance on specialized S&T government-sponsored activities; (4) the Customized Services which allow users to make an appointment to come in and work with the searcher while the search is being performed; and (5) the Special Services to Government Patent Attorneys which are available to all users through on-line retrieval and review of patent applications.

CONSTRAINTS ON DTIC'S CAPABILITIES

4.25. DTIC, like any organization, is subject to constraints on its capabilities to accomplish its mission. These constraints are well known to DTIC itself and are generally recognized by the DoD managers and users of DTIC. The more significant constraints include dependence on outside organizations to submit

documents and data for the DTIC collections and data bases, DTIC's equipment status, personnel strength, and funding. 6/

Data Submission

4.26. Although DoD and Army requirements for R&D organizations to submit information to DTIC are well documented and publicized, both DoD and Army STIP managers are concerned that much information that should go to DTIC is not submitted and is not available to the R&D Community at large. Obviously, DTIC cannot process and distribute information that is not submitted. This matter has recently been addressed by the Army and HQAMC has sent new instructions to the Army R&D Community to stimulate more complete submission of technical reports and work unit summaries to DTIC.

Equipment Status

4.27. The demand for DTIC information products and services continues to grow. Concurrently, the load on the DTIC computer system has increased at a corresponding rate. To meet the increasing traffic and workload placed on the system, DTIC needs to upgrade and enhance its computer hardware and software just to maintain its current level of service to its customers. Because of the considerable expense incurred in purchasing and replacing old equipment with new, DTIC has often not been able to obtain new equipment and technology as needed. DTIC operates with equipment and systems that are to some degree obsolete and

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6/ Information on funding, personnel strength, and equipment has been largely taken from DTIC's publication, DTIC 2000: A Corporate Plan for the Future, published in July 1984.

of limited capability to satisfy effectively and responsively the demands placed upon it.

Personnel Strength

4.28. During the period 1970 to 1984, the personnel strength of DTIC has decreased from over 550 to under 450. This decrease represents approximately a 20% decline in personnel strength during the 15-year period, or a 1.5% decrease per year. By comparison DoD R&D personnel strength has been decreasing at a significantly slower rate, at just under 1% per year. Hence, the ratio of DTIC personnel available to serve its principal customers, the DoD R&D population of scientists and engineers, is getting smaller with each passing year and will continue to do so if the trend remains unchanged.

4.29. At the same time the number of individuals employed by DTIC is decreasing, the average grade of these individuals is also decreasing. The average Civil Service grade for DTIC employees in FY 84 was 8.3 whereas the average grade in FY 71 was about 9.3. The implication of this decline in average grade is that DTIC salaries are not competitive for personnel in the Washington Metropolitan area, especially in the computer fields where many employees are continuously leaving to accept better paying positions in private industry and in other government agencies where higher grades are available. Although the increasing use of automated capabilities has reduced the need for clerical and administrative/technical support labor, the need for highly skilled and experienced professionals in certain specialized areas has increased and will continue to increase in the future with the development and application of new information processing technologies.

Funding

4.30. During the past decade, funding for DTIC has become a problem demanding more and more attention. While the funding for DoD R&D activities has increased from $8.2 billion in FY 74 to $29.6 billion in FY 84, DTIC funding has increased proportionally less, from $10.1 million in FY 74 to about $21.5 million in FY 84. These figures represent a 261% increase in funding for DoD R&D activities during the period 1974 to 1984 as compared to a 113% increase in funding for DTIC during that same period. This difference in the growth rate of funding for DTIC and DoD R&D can be expressed as a 41% decrease in DTIC's portion of the DoD R&D funds over the 11-year period. In many respects DTIC funding has not kept up with the demands for services placed upon DTIC by the R&D activities and functions it supports. The effect of this relative decrease in funding has been manifested in DTIC's inability to acquire and maintain the qualified personnel it needs in the high technology computer areas and to upgrade its equipment and technology to provide efficient and responsive information products and services.

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V. USE OF DTIC RESOURCES BY SCIENTIFIC AND TECHNICAL LIBRARIES AND INFORMATION OFFICES

GENERAL

Content and Organization

5.1. Section V reports study findings about the use of DTIC resources by technical libraries and information offices in selected Army R&D centers and laboratories. It is based on information obtained by visits to five AMC R&D technical libraries followed by a questionnaire survey of 25 Army technical libraries conducted in April 1985.

5.2. This section includes the following subsections:

a. Survey administration and response

b. Requirements for use of DTIC information resources

c. Library resources and procedures for processing DTIC information

d. Benefits for R&D from use of DTIC resources

e. Library comments.

Purpose of the Survey

5.3. The survey was designed to elicit the experience and views of librarians and technical information specialists concerning the use of DTIC information resources by Army scientists and engineers and the benefits these resources provide to the Army R&D process. The objectives were to learn how the libraries use DTIC resources to support their users, to determine the extent to which scientists and engineers use DTIC information resources, and to elicit the perceptions of technical

information specialists about how DTIC information is benefitting Army R&D.

Survey Data

5.4. This section contains tabulation of the survey data, selected narrative comments made by survey respondents, and observations about the significance of the responses as they relate to use of DTIC resources by the S&T libraries and the scientists and engineers whom the libraries support. Survey data are discussed for the sample population as a whole within the main body of the report; data received from individual libraries are included in Appendix F.

SURVEY ADMINISTRATION AND RESPONSE

Organizations Surveyed

5.5. The survey included 25 technical libraries that support Army R&D centers and laboratories. Table 5.1 lists the libraries surveyed and indicates each library's location and the principal laboratories it supports.

Questionnaire Distribution and Response

5.6. The survey materials for each library were sent through a designated point of contact at each laboratory to the chief librarian, by name. The materials included an explanatory letter of transmittal from the Office of the Deputy Chief of Staff for Technology Planning and Management, AMCLD, and a questionnaire. Of the 25 libraries surveyed, 21 completed and returned the questionnaire.

TABLE 5.1
LIBRARIES INCLUDED IN SURVEY*

Library	Location	Principal Laboratories Supported
Army Research Office	Research Triangle Park, NC	Army Research Office
Ballistic Research Laboratory Human Engineering Laboratory Materials & Mechanics Research Center	Aberdeen Proving Ground, MD Aberdeen Proving Ground, MD Watertown, MA	Ballistic Research Lab. Human Engineering Lab. Materials & Mechanics Research Center
Applied Technology Laboratory Aviation Research & Technology Laboratories	Ft. Eustis, VA Moffet Field, CA	Applied Technology Lab. Aviation R&T Labs HQ Office, Aeromechanics Lab.
Army Armament R&D Center	Dover, NJ	Large Caliber Weapons Systems Lab. Fire Control & Small Caliber Weapons Systems Lab.
Benet Weapons Laboratory	Watervliet Arsenal, NY	Benet Weapons Lab. (an element of the Large Caliber Weapons Systems Lab.)
Chemical R&D Center	Aberdeen Proving Ground, MD	Chemical R&D Center
Harry Diamond Laboratories	Adelphi, MD	Harry Diamond Labs. Signals Warfare Lab.
ERADCOM Technical Support Activity	Ft. Monmouth, NJ	Combat Surveillance and Target Acquisition Lab. Electronics Technology & Devices Lab. Electronics Warfare Lab.
Communications & Electronics R&D Center	Ft. Monmouth, NJ	Communications & Electronics R&D Center
Tank-Automotive Laboratory	Warren, MI	Tank-Automotive Lab.

TABLE 5.1 (Cont)

Library	Location	Principal Laboratories Supported
Redstone Scientific* Information Center	Redstone Arsenal	Army Missile Lab.
Belvoir R&D Center	Ft. Belvoir, VA	Belvoir R&D Center Night Vision & Electro-Optics Lab.
Natick R&D Center	Natick, MA	Natick R&D Center
Cold Regions Research & Engineering Laboratory	Hanover, NH	Cold Regions Research & Engineering Lab.
Research Institute for the Behavioral & Social Sciences	Alexandria, VA	Research Institute for the Behavioral & Social Sciences
Medical R&D Command Technical Information Office	Ft. Detrick, MD	All Medical R&D Command Labs. and Institutes
Medical Bioengineering R&D Lab	Ft. Detrick, MD	Medical Bioengineering R&D Lab.
Research Institute of Infectious Diseases	Ft. Detrick, MD	Research Institute of Infectious Diseases
Aeromedical Research Laboratory	Ft. Rucker, AL	Aeromedical Research Lab.
Letterman Institute of Research	San Francisco, CA	Letterman Institute of Research
Medical Research Institute of Chemical Defense	Aberdeen Proving Ground, MD	Research Institute of Chemical Defense
Walter Reed Army Institute of Research	Washington, DC	Walter Reed Army Institute

* Technical Libraries that did not return survey questionnaires include Aviation R&T Laboratories (Moffet Field, CA), ERADCOM Technical Support Activity (Ft. Monmouth, NJ), Communications & Electronics R&D Center (Ft. Monmouth, NJ), and Tank-Automotive Laboratory (Warren, MI).

5.7. The 21 libraries responding to the survey estimate that they support a total of over 11,000 scientists and engineers. This estimate is somewhat higher than the population of scientists and engineers that was estimated based on information contained in the 1983 Laboratory Posture Reports for the laboratories surveyed. However, considering that some of the libraries support other organizations besides the Army laboratory(s) with which they are directly related, this estimate is probably accurate. 1/ About 42% of the scientists and engineers supported by the libraries are involved in basic research while the remaining 58% are involved in applied technology.

REQUIREMENTS FOR USE OF DTIC INFORMATION RESOURCES

Requirements

5.8. **Request Volume**. Librarians estimated that 53% of the information requests they receive require use of DTIC resources and that approximately 56% of the scientists and engineers in the laboratories they support use DTIC resources. Meeting these requirements for DTIC information involves a significant portion of the time of about one-third of library staff personnel. Table 5.2 shows the frequency with which R&D personnel at the laboratories request search of DTIC data bases.

1/ For example, the Redstone Scientific Information Center supports NASA and other smaller organizations at Redstone Arsenal as well as the Army Missile Laboratory.

TABLE 5.2
FREQUENCY OF END-USERS' REQUESTS FOR DTIC INFORMATION*

Frequency of Requests	Libraries Selecting This Response	
	Number	Percent
Frequency with which end users request library to search DTIC data bases when submitting a request for information		
Always	1	5
Usually	9	43
Sometimes	11	52
Never	0	--

* For information on individual responses of libraries, refer to Table F.7 in Appendix F.

5.9. Examination of the survey results concerning requirements for DTIC (see Table F.1 in Appendix F), indicates that there may be a direct relationship between the degree of usage of DTIC by scientists and engineers and the type of R&D activity in which the majority of scientists and engineers at the laboratory are engaged. In nine of the twelve libraries that report 50% or higher DTIC usage by scientists and engineers, 70% or more of these scientists and engineers are primarily involved in applied technology. In contrast, four of the five libraries which report 40% or lower DTIC usage among scientists and engineers estimate that most of their scientists and engineers are involved in basic research. These data suggest that scientists and engineers working in areas of applied research and technology are more likely to use DTIC resources. This observation may be explained in part by the dependence of basic research on

knowledge of natural phenomena and theoretical information, much of which is available in textbooks. By contrast, the applied sciences are more dependent on knowledge of efforts to develop and apply new techniques in technological fields, which is often available in technical reports collected by DTIC.

5.10. **Reasons for Requests**. Libraries were asked to choose up to four reasons from a list of seven to indicate why end users request information from the DTIC data bases. Table 5.3 shows that the two reasons cited most often were "To Identify Others Working in Specific S&T Areas" and "To Search for New Technology." The next two most frequent reasons were "To Evaluate the State of the Art in S&T Area" and "To Demonstrate That R&D Project Is Unique." "To Conduct Background Research for In-House Laboratory Independent Research (ILIR) Programs" and "To Verify References for Background Research" were each selected by 48% of the libraries. The four most frequently cited reasons, "To Identify Others Working in S&T Areas," "To Demonstrate that R&D Project Is Unique," "To Search for New Technology," and "To Evaluate State of the Art in S&T Area" all relate to a primary objective of the DoD STIP--avoidance of duplication of efforts in R&D programs. This finding implies that most scientists, engineers, and librarians recognize the importance of fostering technology transfer.

LIBRARY RESOURCES AND PROCEDURES FOR PROCESSING DTIC INFORMATION

Resources

5.11. **Personnel**. There are 155 people on the staffs of the 21 libraries that completed the survey questionnaire. These 155 individuals support about 8,600 Army scientists and engineers in R&D laboratories contacted during this study effort and 2,400

TABLE 5.3
REASONS FOR REQUESTS FOR DTIC INFORMATION 1/

End Users' Reasons for Requesting Information From DTIC Data Bases	Libraries Selecting This Response	
	Number	Percent of Total
To search for new technology	15	71
To identify others working in specific S&T areas	15	71
To evaluate state of the art in S&T area	14	67
To demonstrate that R&D Project is unique	13	62
To verify references for background research	10	48
To conduct background research for ILIR programs 2/	10	48
Other	2	9

1/ For information on individual responses of libraries, refer to Table F.7 in Appendix F.

2/ In-House Laboratory Independent Research.

other R&D personnel. The ratio of library personnel to R&D personnel is about 1 to 73. However, since not all library personnel are directly concerned with library patrons, the actual ratio of library personnel to R&D patrons is probably more in the realm of 1 library staff member to 100 R&D personnel.

5.12. Of the 155 individuals on the library staffs, 57 spend all or much of their time involved with DTIC-related tasks and are DROLS operators. Of the 57, 88% have received DTIC training on the use and operation of DROLS. The average experience each DROLS operator has with the system is about 5.2 years. The average number of years of experience for all DROLS operators is about five years, but the average number of years of experience for all primary DROLS operators is 7.1 years. Secondary and tertiary operators have about five years of experience, on the average, while the fourth, fifth, and sixth operators average between two to three years of experience. These data are shown in Table 5.4. (Also see Table F.2 in Appendix F.)

5.13. **Equipment**. The majority of technical libraries and information offices surveyed have DROLS terminals. Table 5.5 lists the libraries and shows the number of DROLS terminals they have. Only four of the 21 libraries that responded to the survey did not have their own DROLS terminal. As of April 1985, there were 25 DROLS terminals on site at the 17 libraries with DROLS terminal access. Some locations had terminals with only unclassified access; others had terminals with classified access; and two sites, the Ballistic Research Laboratory and Natick R&D Center, had both unclassified and classified terminal access.

5.14. Most libraries have slow-speed, desk-top, dot matrix or thermal printers connected to a cathode ray tube (CRT) terminal.

TABLE 5.4
EXPERIENCE OF LIBRARY STAFF DROLS USERS

Library	No. on Library Staff Who Operate DROLS Terminals	No. of DROLS Operators Trained by DTIC	Average No. of Years' Experience of DROLS Operators
Army Research Office	1	1	5.0
Ballistic Research Laboratory	5	5	3.4
Human Engineering Laboratory	2	2	1.5
Materials & Mechanics Research Center	2	3	5.6
Applied Technology Laboratory	2	2	7.5
Armament R&D Center	6	6	8.5
Benet Weapons Laboratory	2	1	3.5
Chemical R&D Center	6	3	3.8
Harry Diamond Laboratories	5	5	5.6
Redstone Scientific Information Center	9	5	7.5
Belvoir R&D Center	4	4	4.8
Natick R&D Center	2	2	12.0
Cold Regions Research and Engineering Laboratory	--	--	--
Research Institute for the Behavioral & Social Sciences	3	3	4.3
Medical R&D Command	2	1	4.0
Medical Bioengineering R&D Laboratory	--	--	--
Medical Research Institute of Infectious Diseases	--	--	--
Aeromedical Research Laboratory	2	2	3.0
Letterman Army Institute of Research	2	2	1.0
Medical Research Institute of Chemical Defense	2	2	2.0
Walter Reed Army Institute of Research	--	--	--
Total	57	50	
Average Years of experience of all DROLS operators			5.2

TABLE 5.5
LIBRARY RESOURCES FOR USING DROLS

Library*	No. of DROLS Terminals	Type of Terminal Access: Classified (C) or Unclassified (U)
Army Research Office	1	U
Ballistic Research Laboratory	2	C,U
Human Engineering Laboratory	1	U
Materials & Mechanics Research Center	1	C
Applied Technology Laboratory	1	C
Armament R&D Center	2	C
Benet Weapons Laboratory	1	U
Chemical R&D Center	1	C
Harry Diamond Laboratories	2	C
Redstone Scientific Information Center	4	C
Belvoir R&D Center	1	C
Natick R&D Center	2	C,U
Cold Regions Research and Engineering Laboratory	0	--
Research Institute for the Behavioral & Social Sciences	1	U
Medical R&D Command	2	U
Medical Bioengineering R&D Laboratory	0	--
Medical Research Institute of Infectious Diseases	0	--
Aeromedical Research Laboratory	1	U
Letterman Army Institute of Research	1	U
Medical Research Institute of Chemical Defense	1	U
Walter Reed Army Institute of Research	0	--
Total	25	

* Includes only libraries that returned questionnaires.

Some libraries also have equipment that enables them to print paper copies of documents from microfiche.

Procedures

5.15. **Interaction with Customers**. Libraries were asked to estimate the relative frequency with which end users use various methods for requesting information from the library. They estimate that 52% of the requests are made in person at the library by the scientist or engineer desiring the information. Another 30% of requests are submitted in writing, oftentimes on preprinted request forms supplied by the libraries. The telephone is used to submit 17% of the requests.

5.16. When asked if they used personal interviews with end-users to discuss information requests, eight of the libraries reported that they always used them, nine reported that they usually used such interviews, and three reported that they sometimes used interviews. Only one library indicated that it never used personal interviews. The finding that end users submit 52% of all information requests in person suggests that most librarians and end users perceive the importance of direct personal communication in submitting requests for information.

5.17. Libraries with DROLS terminals were asked to indicate how frequently end users were present at the DROLS terminal while the operator conducted a search of the DTIC data bases. Of the 17 libraries with terminals, one reported that end users were always present, four reported that they were usually present, and 12 reported that they were sometimes present. Table 5.6 shows the data concerning library procedures for processing customer requests. The presence of the end user at the terminal during the conduct of the search is important to the outcome and

TABLE 5.6

LIBRARY PROCEDURES FOR PROCESSING END USER INFORMATION REQUESTS 1/

Item	Number	Percent
End-User methods of submitting information requests to the library:		
Written requests	--	30
Telephone requests	--	17
Requests made in person	--	52
Other requests	--	1
Total	--	100
Library uses personal interviews with end users to discuss information requests:		
Always	8	38
Usually	9	43
Sometimes	3	14
Never	1	5
Total	21	100
End users are present while DROLS terminal operator conducts search of DTIC data bases 2/		
Always	1	6
Usually	4	23
Sometimes	12	71
Never	0	0
Total	17	100

1/ To see the individual responses of the libraries surveyed, refer to Table F.5 in Appendix F.

2/ The four libraries without DROLS Terminals could not respond to this question.

success of the search. By observing the search results as they come up on the screen, the end user may be able to assist the DROLS operator in restructuring the search strategy to be more effective in locating the needed information.

5.18. **Ordering Technical Reports**. Libraries may order technical reports from DTIC in either paper copies or microfiche using DROLS, telephone requests, or correspondence. (Microfiche copies are cheaper than paper.) Upon receipt of a document request, DTIC will reproduce the document and mail it to the requestor. Typically, the time lapse from DTIC receipt of the request until the requested document is received by the requestor is from 1 to 4 weeks.

5.19. About half of the libraries surveyed hold a significant portion of the DTIC Technical Report microfiche collection. Of these, six use their microfiche for local reproduction of paper copies for their users. This process significantly reduces the amount of time required to provide a customer with a requested document. Local reproduction of paper copies from microfiche is constrained, however, by the availability of library staff personnel to process the documents and by the equipment available at the library. For these reasons, some libraries that reproduce short technical reports locally still request DTIC to reproduce and send the more lengthy documents.

5.20. **Ordering Bibliographies and Work Unit Summaries**. When asked how they obtain paper copies of Technical Report Bibliographies and Work Unit Summaries, the libraries reported that about 50% of the time they use DROLS to order such documents from DTIC, which then prints them out and mails them to the requestor. Another 15 to 20% of the time the libraries request bibliographies and Work Unit Summaries by telephone or written

correspondence. The libraries print out bibliographies and Work Unit Summaries locally only about one-third of the time, usually because they must use desk-top printers which print relatively slowly. Use of slow-speed printers for lengthy bibliographies and Work Unit Summaries ties up their terminals for an inordinate amount of time. Thus, although Technical Report Bibliographies and Work Unit Summaries are stored on-line by DTIC, about two-thirds of the time when libraries request DTIC to print out and mail these documents, the turnaround time becomes a matter of weeks rather than minutes or hours. The survey results about library procedures for obtaining DTIC information in hard copy are shown in Table 5.7.

5.21. To obtain DTIC documents for their patrons more rapidly, libraries should increase their holdings of microfiche copies of technical reports and obtain the equipment needed, if lacking or inadequate, to print paper copies of technical reports from microfiche.

5.22. Considering the increasing cost of ordering paper copies from DTIC and the reduction in the time that a customer would wait to receive a document, the benefit of local reproduction would be considerable. Likewise, by upgrading the speed and quality of the printers connected to their DROLS terminals, libraries could print out bibliographies and Work Unit Summaries locally and avoid ordering them from DTIC and having them transmitted by mail.

TABLE 5.7

LIBRARY PROCEDURES FOR OBTAINING DTIC INFORMATION IN HARD COPY*

Item	Number	Percent
Library has significant portion of technical report collection in microfiche:		
Yes	10	48
No	10	48
No response	1	2
Total	21	100
Library uses microform copies of technical reports to print out paper copies locally:		
Yes	6	29
No	6	29
No response	9	42
Total	21	100
Methods used by libraries to obtain hard-copy bibliographies from DTIC data bases:		
Percent printed out locally	--	31
Percent ordered on-line from DTIC	--	52
Percent ordered off-line from DTIC	--	17
Total		100
Methods used by libraries to obtain hard-copy work unit summaries from DTIC WUIS data base:		
Percent printed out locally	--	32
Percent ordered on-line from DTIC	--	47
Percent ordered off-line from DTIC	--	20
Percent other methods	--	1
Total		100

* To see the individual responses of the libraries surveyed, refer to Table F.4 in Appendix F.

Participation in the CAB and ADD Programs

5.23. Table 5.8 shows the libraries' participation in the DTIC Current Awareness Bibliography and Automatic Document Distribution programs and the types of CAB/ADD subject profiles that are maintained by the libraries for that participation. The figures in the table suggest that the CAB program is being greatly underused as an information resource. In all of the libraries surveyed, there were only 213 profiles being maintained for individual end users, about 2% of the entire population of Army R&D scientists and engineers at the laboratories surveyed. Two libraries maintained a single CAB subject profile for their entire laboratories.

TABLE 5.8

LIBRARY PARTICIPATION IN DTIC CURRENT AWARENESS *BIBLIOGRAPHY (CAB) AND AUTOMATIC DOCUMENT* DISTRIBUTION (ADD) PROGRAMS*

Item	CAB	ADD
Number of profiles maintained for individual end users	213	8
Number of profiles maintained for entire laboratory	2	11

* For information on individual responses of the libraries, refer to Table F.6 in Appendix F.

5.24. Of the 21 libraries that responded to the survey, 11 subscribe to ADD for their own use. Only eight ADD profiles are maintained for individual end-users. These figures and librarians' comments show that the ADD program is primarily used by libraries to maintain their own collections of technical reports produced by individuals in their own laboratories. ADD is not used by individual scientists and engineers because they do not find it useful to receive microfiche copies of entire technical reports. The CAB, which provides bibliographic citations, is

more useful to individual users, who can then review the bibliography to identify and order the technical reports relevant to their work.

5.25. **Cataloging and Indexing**. Several survey questions addressed library use of the DROLS for cataloging and indexing. Cataloging involves the preparation of a bibliographic record for a document and the use of that record for document control and storage by the library and for retrieval of the document for the library's customers. Indexing of documents involves the assignment of descriptive terms to the bibliographic record of a document. These descriptive terms (sometimes called keywords, subject terms, or descriptors) provide an indication of the substantive content of the document. The more comprehensive and accurate the descriptive terms assigned to a document record are, the more likely it is that the scientist or engineer looking for information on a particular topic will be able to locate relevant documents.

5.26. **Cataloging**. Several of the libraries have not automated their document catalogs as yet. The 17 libraries that have DROLS terminals are potentially capable of using DROLS capabilities to assist their cataloging and indexing efforts. Ten of them have found that use of DROLS and the DTIC Technical Report Data Base as a catalog for documents held by the library and referenced in the Technical Report Data Base has been helpful. The record on each document in the Technical Report Data Base contains a complete bibliographic record as well as descriptive terms and an abstract. Use of this record can relieve the library staff of part of the tedious manual preparation of catalog cards usually associated with cataloging and enhance the search for and retrieval of documents from the library's collection.

5.27. **Indexing**. Comprehensive and accurate indexing of documents submitted to the DTIC Technical Report Data Base is very important. Inaccurate or incomplete indexing reduces the probability that a user looking for specific information in the data base will be able to find it.

5.28. Nineteen libraries responded to a question concerning possible problems with indexing of DTIC documents. Thirteen reported that DTIC indexing for the Technical Report Data Base is generally adequate for the library's purposes. The remaining six reported that the indexing was inadequate, the most frequently cited problem being that the indexing is too general. The next most frequently cited problem was that the quality of the indexing is inconsistent. The third was that the DDC Retrieval and Indexing Terminology is difficult to use. Table 5.9 summarizes these responses to questions concerning DTIC indexing.

5.29. The library survey response suggests that indexing of documents for the Technical Report Data Base can be improved by Army technical library participation in the DTIC Shared Bibliographic Input Network. As shown in Table 5.10, five libraries reported that they use DROLS to participate in SBIN; all five reported that this improved their ability to locate reports in the Technical Report Data Base. The information specialists at a library supporting a laboratory become familiar with the technical content of their laboratory's technical reports and the terms to use to search for their documents. With this information, the information specialists are normally able to provide more complete and accurate indexing than can be done by DTIC indexers, who are faced with a very large volume of documents to process that cover all the S&T areas of interest to DoD. Thus, the benefits of SBIN participation are three-fold: it expedites

TABLE 5.9
LIBRARY EVALUATION OF DTIC TECHNICAL REPORT INDEXING

Item	Number	All Responses, Percent
DTIC TR indexing is adequate for library purposes:		
Yes	13	62
No	6	29
No response	2	9
Total	21	100
Problems with TR indexing:*		
Indexing is too general	9	47
DRIT is difficult to use	5	26
Quality of indexing is inconsistent	7	37
No problems experienced	3	16
Other	5	26

* Libraries could indicate more than one problem if desired.

TABLE 5.10
LIBRARY USE OF DROLS FOR CATALOGING AND INDEXING

Item	Yes		No	
	Number	Percent	Number	Percent
Library uses DROLS to catalog/index technical reports for SBIN 1/	5	29	12	71
Library participation in SBIN improved ability to locate technical reports 2/	5	100	--	--

1/ Libraries without DROLS Terminals could not respond to questions concerning use of DROLS.

2/ The 16 libraries that did not participate in SBIN could not respond to this question.

getting technical reports into the data base and reduces the work load for DTIC indexers; it provides more complete and accurate indexing terminology; and it enables DROLS operators to use the Technical Report Data Base more effectively.

5.30. Another factor in indexing is the completeness and accuracy with which those who prepare technical reports fill out the DD Forms 1473 they submit with their reports. The authors of a report are more familiar with its content and are more qualified to identify the most important descriptive terms for indexing than anyone else. Although completion of 1473s was not addressed in the survey, it is known that 1473s are often hurriedly prepared as the last task before publication of a report, and that inadequate attention may be paid to the assignment of subject terms in item 18 and to preparation of the abstract in item 19. When this situation occurs, the adequacy of indexing must rely on the local library staff (if they participate in the SBIN) and on DTIC indexers, who may not be as well qualified to select descriptive terms and prepare abstracts.

5.31. Interviews with several librarians and questionnaire comments indicate that the current DTIC thesaurus, the DRIT, is of limited usefulness. The presently available edition was published in May 1979, and in the years since that date there has been considerable expansion of old technologies and development of new technologies, accompanied by the creation and use of many new technical vocabularies. Many terms now in use are not contained in the current DRIT. Publication of an up-to-date version of the thesaurus will be a significant help to those scientists, engineers, and library and DTIC staff personnel who are responsible for the indexing of technical reports and other

documents to be entered into the DTIC Technical Report Data Base. 2/

BENEFITS FOR R&D FROM USE OF DTIC RESOURCES

End-User Satisfaction with DTIC Resources

5.32. Asked to estimate how often end users are satisfied with DTIC information, one of the 20 responding libraries reported that end users were always satisfied; 17 of the libraries reported that end users were usually satisfied; and two of the libraries reported that end users were satisfied only sometimes.

5.33. **Benefits of DTIC Use**. To obtain a general idea of what end users view as the benefits of using DTIC, libraries were asked to estimate how frequently end users mention certain benefits of DTIC information resources. A scale of 0 to 6 was used to estimate the frequency of possible comments (0 = never; 6 = frequently). The responses of all the libraries were averaged. Based on the survey results, the most frequently mentioned benefits were "prevention of duplication of DoD R&D effort," which ranked 4.8 on the scale, and that DTIC is a "unique information source," ranking 4.7 on the scale. "Reduction in R&D project time," which ranked 3.8 on average, is another frequently mentioned benefit. The relatively high frequency with which these benefits of DTIC use are perceived suggests that DTIC is indeed doing a great deal to achieve the objectives of the DoD Scientific and Technical Information Program.

2/ DTIC is currently revising the DRIT; publication is expected in 1986.

DTIC Shortcomings

5.34. When asked to estimate the frequency with which end users mention shortcomings of the DTIC information resources and services, the libraries reported "slow distribution of hard-copy documents" as the most frequent, the average ranking being 3.9 (on the same scale used for the benefits). Other shortcomings were cited much less often and were rated between 1 and 2 on the scale. One shortcoming cited several times in the comment section of the questionnaire was occasional poor legibility of paper documents. As suggested in paragraph 5.22, if libraries decrease reliance on DTIC to provide documents in paper copy by acquiring more microfiche, adequate microfiche copiers, and faster printers, they could significantly reduce problems experienced with slow turnaround for delivery of documents from DTIC.

5.35. Table 5.11 summarizes the benefits and shortcomings of DTIC information resources as perceived by the libraries.

LIBRARY COMMENTS

5.36. The libraries were asked to provide any general remarks or concerns they had about DTIC resources and services. The following statements paraphrase these comments:

> The DTIC computer system needs improvement. The system needs better hardware with greater capability and new software which is more user-friendly and has greater flexibility in performing searches and retrievals. At present, computer down time is sometimes a problem and response time is slow. The software is cumbersome to use for conducting searches and lacks the more powerful features found in commercial automated information systems such as Lockheed DIALOG, SDC ORBIT, and Bibliographic Research Services (BRS).

TABLE 5.11

LIBRARY EVALUATION OF BENEFITS AND SHORTCOMINGS OF DTIC INFORMATION RESOURCES AND SERVICES*

Item	Responses	
	Number	Percent
DTIC information appears to satisfy end user requests:		
Always	1	5
Usually	17	81
Sometimes	2	9
Never	0	0
No response	1	5
Total	21	100

Benefits of DTIC information: (6 = most frequent; 0 = not applicable)	Average Response
Reduction in R&D project time	3.8
Cost reduction	2.5
Prevention of duplication of DoD R&D efforts	4.8
Reduction in information search time	3.1
Unique information source	4.7
Stimulation of new designs/methods	1.9
Other	0

Shortcomings of DTIC information and services: (6 = most frequent; 0 = not applicable)	Average Response
Provides excessive bibliographic references	1.5
Provides insufficient bibliographic references	1.3
Slow distribution of hard-copy documents	3.9
Information not relevant	1.4
Information not current	1.6
Other	0.8

* For Information on the individual responses of the libraries surveyed, refer to Table F.8 in Appendix F.

The DDC Retrieval and Indexing Terminology (DRIT) needs to be reviewed to update terminology and add new terms associated with developing technologies. The current DRIT is old and the terminology it contains for some scientific areas is not sufficiently detailed. A new thesaurus should ensure that terminology used for report indexing is accurate, complete, and standardized.

There is little quality control on spelling of authors' names, indexing terms, and corporate names. Indexing of technical reports is sometimes not detailed and comprehensive enough to permit retrieval of reports related to specific aspects of some technologies or materiel development.

Many technical reports and work unit summaries that should go to DTIC are never submitted. More stringent management action should be taken to ensure that all R&D activities promptly submit their technical reports and work unit summaries to DTIC.

The turnaround time on documents is inconsistent. Improvements are needed to reduce the time it takes to receive documents from DTIC.

Hard copy documents received from DTIC are sometimes difficult to read. Steps should be taken to improve the quality of reproduced documents.

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VI. USE OF DTIC INFORMATION RESOURCES AND SERVICES BY ARMY R&D SCIENTISTS AND ENGINEERS

GENERAL

Content and Organization

6.1. Section VI reports the findings of a survey of Army scientists and engineers about their use of DTIC information resources and services. The first phase of the survey was conducted during April 1985, the second phase in July and August 1985.

Organization

6.2. The following subsections are included:

a. Phase I survey results

(1) Questionnaire distribution and response

(2) Extent of use of DTIC information resources

(3) User evaluation of DTIC information resources

(4) Reasons for non-use of DTIC resources

b. Phase II survey results

(1) Questionnaire distribution and response

(2) Characteristics of the sample population

(3) Use of DTIC resources

(4) Evaluation of DTIC information resources and services

c. Comments about DTIC by Army R&D Scientists and Engineers.

Purpose of the Survey

6.3. Phase I of the survey was administered to the Army R&D laboratory population at large to obtain data about the extent and perceived value of Army R&D use of DTIC. Phase II was administered to selected R&D scientists and engineers to elicit detailed information about their experience in using DTIC resources and their perceptions of the benefits provided by DTIC information and services.

Survey Data

6.4. This section contains tabulations of the aggregate survey data, observations about the significance of the data, and selected comments made by survey respondents. Data from the individual laboratories and R&D centers are provided in Appendix G.

PHASE I SURVEY RESULTS

Questionnaire Distribution and Response

6.5. The Phase I survey questionnaires were sent to designated points of contact at each of 29 Army R&D laboratories and centers for distribution to all bench-level and first-line supervisory R&D scientists and engineers in those organizations. Based on the 1983 Laboratory Posture Statements, it was estimated that about 8,600 scientists and engineers would receive the questionnaires. The number of questionnaires sent to each

laboratory was based on the number of professional personnel reported in the laboratory's posture statement. The letter of transmittal for the questionnaires, prepared by the Office of the AMC Deputy Chief of Staff for Technology Planning and Management, explained the objectives of the study and included directions for distribution, completion, and return of the questionnaires.

6.6. The response to the Phase I survey is shown in Table 6.1. The table lists the laboratories and centers surveyed, their estimated number of scientists and engineers, the number of questionnaires returned, and the percent response based on the estimated population at each laboratory.

6.7. Questionnaires were completed and returned by 25 of the 29 laboratories and centers. One organization, the Aviation Engineering Flight Activity at Edwards Air Force Base, California, responded that DTIC had not been used there in 8 years and returned no questionnaires. The other three organizations that did not return questionnaires reported they did not receive the survey materials. By the time this information was obtained by the study team it was too late to distribute replacement questionnaires to these organizations, collect completed questionnaires, and process the collected data for inclusion in the study findings.

6.8. The 25 responding organizations returned a total of 3,200 questionnaires. Of these, 33 were found to be blank or otherwise invalid, leaving a total of 3,167 valid questionnaires. This constitutes a 37% response from the estimated population of the laboratories and centers that participated in the survey.

TABLE 6.1

SURVEY RESPONSE FROM ARMY R&D ORGANIZATIONS (QUESTIONNAIRES DISTRIBUTED TO ORGANIZATIONS)

Organization	Estimated 1/ Number of Scientists and Engineers	Number of Questionnaires Returned	Percent Response
Army Research Office	41	30	73
Ballistic Research Laboratory	422	290	69
Human Engineering Laboratory	127	68	54
Materials and Mechanics Research Center	257	107	42
Aviation Research and Technology Labs HQ and Aeromechanics Lab	125	36	29
Applied Technology Laboratory	146	107	73
Aviation Engineering Flight Activity	56	0 2/	0
Chemical Research and Development Center	635	469	74
Fire Control and Small Caliber Weapons System Laboratory	429	44	10
Large Caliber Weapons System Laboratory	1,069	27	3
Communications Electronics Command R&D Center	384	97	25
Atmospheric Sciences Laboratory	113	56	50
Combat Surveillance and Target Acquisition Laboratory	106	62	59
Electronics Technology and Devices Laboratory	185	156	84
Electronic Warfare Laboratory	281	42	15
Harry Diamond Laboratories	368	236	64
Night-Vision and Electro-Optics Laboratory	222	166	75

TABLE 6.1 (Cont)

Organization	Estimated [1] Number of Scientists and Engineers	Number of Questionnaires Returned	Percent Response
Army Missile Laboratory	807	400	50
Tank-Automotive Systems Laboratory	239	115	48
Belvoir R&D Center	465	202	43
Natick R&D Center	431	246	57
Cold Regions Research and Engineering Laboratory	128	40	31
Army Research Institute for the Behavioral and Social Sciences	301	0 [3]	0
Aeromedical Research Laboratory	49	19	39
Letterman Army Institute of Research	148	95	64
Medical Bioengineering R&D Laboratory	72	48	67
Medical Research Institute of Chemical Defense	116	42	36
Medical Research Institute of Infectious Diseases	196	0 [3]	0
Walter Reed Army Institute of Research	664	0 [3]	0
Total	8,582	3,200	37

[1] Estimates are based on 1983 Laboratory posture statements.

[2] No response; the point of contact at this organization stated that they have not used DTIC for 8 years.

[3] Organization reported that survey materials were not received.

6.9. Although the 37% response was lower than the expected 70 to 80% response, the 3,167 valid questionnaires received do represent a very large sample of the Army's R&D scientists and engineers. Of the 25 organizations that returned completed questionnaires, 14 provided responses from at least 50% of their bench-level R&D personnel and first-line supervisors. The 37% response appears large enough to provide a reasonably accurate representation of the use of DTIC resources by the Army R&D Community as a whole, although the data may not be entirely applicable to any individual organization. Inspection of the data, however, suggests that estimates of the use and value of DTIC resources are fairly consistent among the different organizations.

Extent of Use of DTIC Information Resources

6.10. Of the 3,167 respondents, 1,863 (59%) use DTIC information; 1,304 do not. These figures are consistent with the results of the library survey. Librarians estimated that 56% of their customers use DTIC resources. Although it is possible that some scientists and engineers are using information supplied by their library without knowing that DTIC was the original source of the information, it seems reasonable to estimate that DTIC information is being used to some extent by 60% of the Army R&D community. Table 6.2 shows the percent of questionnaire respondents at each laboratory who stated they use DTIC resources. The table also identifies the library supporting the laboratory and notes if the library has one or more DROLS terminals. All the laboratories and centers are supported by their own or colocated technical libraries; and all libraries except one have use of DROLS terminals for access to the DTIC data bases. In 19 of the 25 laboratories and centers, about 45% or more of the scientists and engineers use DTIC information. The

TABLE 6.2
USE OF DTIC INFORMATION BY ARMY R&D ORGANIZATIONS

R&D Organization	Supporting Library	Library Has DROLS Terminal(s)	% of Respondents That Uses DTIC Information
Army Research Office	ARO Library	Yes	70
Ballistic Research Lab	BRL Library	Yes	68
Human Engineering Lab	HEL Library	Yes	85
Army Materials and Mechanics Research Center	AMMRC Library	Yes	73
Aviation R&T Labs	HQ, Aviation R&T Library	Yes	26
Applied Technology Lab	Applied Technology Lab Library	Yes	92
Chemical R&D Center	CRDC Library	Yes	47
Fire Control and Small Caliber Weapons System Laboratory	ARDC Library	Yes	59
Large Caliber Weapons System Laboratory	ARDC Library	Yes	96 1/
CECOM R&D Center	CECOM Library	Yes	45
Atmospheric Sciences Lab	ASL Library	Yes	57
Combat Surveillance and Target Acquisition Laboratory	ERADCOM Tech Spt Act	Yes	43
Electronics Technology and Devices Lab	ERADCOM Tech Spt Act	Yes	55
Electronic Warfare Lab	ERADCOM Tech Spt Act	Yes	54
Harry Diamond Labs	ERADCOM Library	Yes	60

TABLE 6.2 (Cont)

R&D Organization	Supporting Library	Library Has DROLS Terminal(s)	% of Respondents That Uses DTIC Information
Night-Vision & Electro Optics Lab	Belvoir R&D Center Library	Yes	55
Army Missile Laboratory	Redstone Scientific Information Center	Yes	58
Tank-Automotive Systems Laboratory	TACOM Library	Yes	71
Belvoir R&D Center	Belvoir R&D Center Library	Yes	65
Natick R&D Center	Natick R&D Center Library	Yes	54
Cold Regions R&E Lab	CRREL Library	No 2/	59
Aeromedical Research Lab	ARL Library	Yes	94
Letterman Institute of Research	Letterman Library	Yes	27
Medical Bioengineering R&D Lab	Med Bio engineering R&D Lab Library	Yes 3/	72
Medical Research Institute of Chemical Defense	MRICD Library	Yes	59

1/ LCWSL returned only 27 questionnaires from an estimated R&D population of over 1,000 scientists and engineers. This small response makes the resulting figure of 96% of its R&D personnel as DTIC information users doubtful.

2/ CRREL obtains DROLS access through the terminal operated at the Office of the Chief of Engineers; however, CRREL is not colocated with the COE.

3/ This organization obtains access to DROLS through HQ, Army Medical R&D Command, which is colocated with the laboratory.

Human Engineering Lab, the Aeromedical Research Lab, and the Applied Technology Lab (at Fort Eustis, VA) have the highest percentages of DTIC information users; the Aviation R&T Laboratories Headquarters and the Aeromechanics Lab (at Moffet Field, CA), and the Letterman Institute of Research have lower percentages of DTIC users.

6.11. Most libraries have specific programs to inform their users about DTIC resources. All three of the laboratories reporting highest use of DTIC information by R&D personnel are supported by libraries that have active programs for publicizing DTIC resources. The Applied Technology Laboratory library provides library orientation tours which include reference to DTIC resources and makes broad circulation of reproduced copies of the DTIC Current Awareness Bulletin. The Human Engineering Laboratory library displays DTIC brochures, circulates DTIC information through internal distribution, and gives all new employees a briefing that includes mention of services available from DTIC. The Aeromedical Research Laboratory library conducts selected dissemination of information for individuals; conducts briefings; and distributes handouts, brochures, and acquisition lists. Several other laboratories that reported higher rates of DTIC use by R&D personnel are also supported by libraries that take a very active approach to publicizing DTIC resources.

User Evaluation of DTIC Information Resources

6.12. The R&D scientists and engineers who use DTIC information were asked to evaluate the importance of that information to their work, using a scale of 0 to 5, in which 0 = no value and 5 = very high value. This question was answered by 1,826 respondents. The average response was 3.1; that is, that DTIC information is of moderate value. However, 49% of the

respondents replied that DTIC information was of high to very high value to their work (see Table 6.3). If these figures are generalized to the entire Army R&D population, they suggest that DTIC information resources are considered to be of high or very high value by approximately 5,000 scientists and engineers in the organizations surveyed.

6.13. The scientists and engineers who use DTIC information were asked to identify the benefits by indicating which one of a list of suggested benefits was most important to them; 1,854 respondents answered this question. The responses to this question are shown in Table 6.4. The benefit selected by 44% of the respondents was "reduction in information search time." This selection appears to reflect an appreciation by R&D personnel that they can request their library to conduct a search of the DTIC data bases and feel confident that they will receive the results of a comprehensive literature search of relevant documents with relatively small investment of their own time. Another 31% noted that DTIC is a unique information resource, thus reflecting their appreciation of the fact that much of the information held by DTIC is unavailable elsewhere. (Comments obtained during Phase II of the user survey, which is described later in this section, support this observation.)

6.14. The next most frequently mentioned benefits were "prevention of duplication of R&D efforts" and "reduction in R&D project time." Each of these benefits was selected by about 10% of the responding scientists and engineers. The achievement of these benefits supports the objectives of the DoD STIP. Their identification by R&D personnel is consistent with the identification of these factors by librarians as being the most important benefits derived from the existence of DTIC resources.

TABLE 6.3
END USERS' EVALUATION OF DTIC INFORMATION RESOURCES*

Value of DTIC Information Resources to the work Scientists and Engineers		
Value Rating	Responses	
	Number	Percent
0 (No value)	5	1
1	96	5
2 (Moderate value)	206	11
3	628	34
4	602	33
5 (Very high value)	289	16
Total Responses	1826	100

* For responses from individual laboratories surveyed, refer to Table G.1 in Appendix G.

TABLE 6.4
END USER EVALUATION OF BENEFITS OF DTIC INFORMATION RESOURCES AND SERVICES 1/

Benefits of DTIC Information Resources	Responses 2/	
	Number	Percent
Reduction in information search time	820	44.2
Unique information source	569	30.7
Prevention of duplication of DoD R&D efforts	189	10.2
Reduction in R&D project Time	178	9.6
Other	47	2.5
Stimulation of new designs/methods	36	2.0
Cost reduction	15	0.8
Total	1,854	100.0

1/ For responses from individual laboratories surveyed, refer to Table G.2 in Appendix G.

2/ Responses were obtained from the scientists and engineers who reported they use DTIC resources.

6.15. In retrospect, it appears that the questionnaire should have asked R&D scientists and engineers two questions about the benefits obtained from DTIC instead of just one. The first question should have been, "What benefits do you derive from the automation of DTIC data bases and the accessibility of these data bases through an on-line system?" The answer, based upon the questionnaire responses described in paragraph 6.13, would have been clearly: "Automation of DTIC resources enables me to obtain a comprehensive literature search of a unique collection of documents related to military R&D with a relatively small investment of time on my part or on the part of the librarians who support me. This allows me more time to attend to my primary functions of information analysis and conduct of original research and design activities."

6.16. The second question should have been, "Once you have obtained information supplied from DTIC data bases, is it beneficial to your work?" The data collected from the librarians and the statistics presented in Table 6.4 (on the preceding page) strongly suggest that the most frequent answers would have been "prevention of duplication of R&D effort," and "reduction in R&D project time." The attainment of these benefits directly supports the objectives of the STIP. The fact that many R&D scientists and engineeers are recognizing these benefits is an indication that DTIC is fulfilling its mission to a significant extent.

6.17. The suggested benefit, "cost reduction," will obviously be attained if "duplication of effort" and "reduction in project time" are achieved. As was shown in Table 6.4, very few people selected this suggested benefit as being most important to them.

Comments made in response to the Phase II Survey by several respondents suggest that most bench-level R&D personnel are little involved with their project or work unit budgets.

Reasons for Non-Use of DTIC Resources

6.18. The 1,304 R&D scientists and engineers who indicated that they did not use DTIC information resources were asked "Why not?" Their responses are shown in Table 6.5. Over 800 replied that they were not aware of the existence of DTIC. This response indicates that 25% of the R&D scientists and engineers in the organizations surveyed are not aware of DTIC (800 "not aware" responses divided by a total of 3,167 respondents = 25%). 1/ This finding, coupled with the previous observation that 49% of those who do use DTIC resources find them of high value to their R&D work, strongly implies that Army R&D management, Army laboratories, and DTIC should do more to publicize DTIC information resources and services and the procedures for using them.

6.19. Other responses to the question "If you don't use DTIC resources, why not?" included "inconvenient to use," and "information not relevant to subject area of interest." These reasons were cited by about 9% of the respondents. The "inconvenient to use" response may suggest that some R&D personnel are not aware

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1/ The lack of awareness of DTIC by many R&D personnel was noted by several of the laboratory points of contact for the survey. These POCs commented that after the questionnaires were distributed to the scientists and engineers, they received phone calls from people asking, "What's DTIC?" One library staff member, who knew about the number of "non-aware" responses from her laboratory personnel, noted that most of these responses were from the more recently employed individuals.

TABLE 6.5
REASONS FOR NON-USE OF DTIC INFORMATION RESOURCES [1]

Reasons	Responses [2]	
	Number	Percent
Not aware of DTIC	813	62.9
Inconvenient to use	118	9.1
Information not relevant to subject area(s) of interest	114	8.8
Other	248	19.1
No response	11	0.1
Total	1,304	100.0

1/ For information on aggregate responses of individual libraries, refer to Table G.3 in Appendix G.

2/ Figures are based on the 1,304 scientists and engineers who reported non-use of DTIC resources.

they can telephone their library with an information request. It may also be a reflection of their dislike of reading through long bibliographies of technical reports to find a few relevant documents. If this is true, it suggests that R&D personnel should be taught how to assist their library staff members in structuring search queries for the Technical Report Data Base. Some library personnel have commented that their users often give only very general guidance when requesting a literature search, and are then surprised when a large number of references are provided to them, or the results are not relevant to their needs.

6.20. The response "information not relevant to subject area of interest" may indicate that reports in some technical areas are not being submitted to DTIC. The survey data does not substantiate this observation, however, and inspection of the responses from the individual laboratories does not identify any particular technical areas that have a higher percent of "not relevant" responses.

PHASE II SURVEY RESULTS

Questionnaire Distribution and Response

6.21. The Phase II survey of R&D scientists and engineers was conducted to elicit detailed information about the benefits to R&D obtained from DTIC resources and services by scientists and engineers who are familiar with them and value their availability. The survey of such knowledgeable users was expected to provide detailed data about specific cases in which DTIC resources helped the R&D process, obtain knowledgeable perceptions about end-user procedures for use of DTIC resources, and possibly

suggest the potential benefits to be obtained if use of DTIC resources by R&D personnel is expanded.

6.22. The Phase II Survey sample of 247 R&D scientists and engineers was selected from those Phase I respondents who use DTIC information and rated its value very highly. An effort was made to select respondents in proportion to the number of scientists and engineers in each laboratory, but at least two questionnaires were sent to each laboratory that participated in the Phase I survey. The survey materials were sent to a designated point of contact at each laboratory for distribution within the laboratory to the selected scientists and engineers. The survey package included an explanatory cover letter from the Office of the Deputy Chief of Staff for Technology Planning and Management, a distribution list identifying the scientists and engineers at the laboratory chosen to receive questionnaires, and a set of questionnaires.

6.23. As shown in Table 6.6, of the 247 questionnaires sent out, a total of 175 were returned from 21 of the 25 laboratories contacted, a 71% response from the sample population. The four laboratories that did not respond to the Phase II survey--the Army Research Office, the Atmospheric Sciences Laboratory, the Combat Surveillance and Target Acquisition Laboratory, and the Cold Regions Research and Engineering Laboratory--all reported that they did not receive the survey materials. Some of the organizations that did return questionnaires noted that some of the selected respondents had left the organization or were unavailable because of leave or travel.

TABLE 6.6
DISTRIBUTION OF DETAILED END-USER SURVEY QUESTIONNAIRES

Organization	Question-naires Distributed	Questionnaires Returned	
		Number	Percent
Army Research Office	3	0	0
Ballistic Research Laboratory	25	25	100
Human Engineering Laboratory	6	5	83
Army Materials & Mechanics Research Center	10	7	70
HQ Aviation R&T Labs and Aero-mechanics Lab	2	2	100
Applied Technology Laboratory	10	7	70
Chemical R&D Center	25	20	80
Fire Control & Small Caliber* Weapons Systems Laboratory	7	7	100
Large Caliber Weapons Systems* Laboratory	2	2	100
Communications-Electronics R&D Center	8	8	100
Atmospheric Sciences Laboratory	5	0	0
Combat Surveillance and Target Acquisition Laboratory	6	0	0
Electronics Technology and Devices Laboratory	13	11	85
Electronic Warfare Laboratory	3	3	100
Harry Diamond Laboratories	21	11	52
Night-Vision and Electro-Optics Laboratory	15	11	73
Army Missile Laboratory	25	13	52
Tank-Automotive Laboratory	7	4	57
Belvoir R&D Center	14	7	50
Natick R&D Center	18	16	89
Cold Regions Research and Engineering Laboratory	3	0	0
Aeromedical Research Laboratory	2	1	50
Letterman Institute of Research	8	7	88
Medical Bioengineering R&D Laboratory	4	4	10
Medical Research Institute of Chemical Defense	5	4	80
Total	247	175	71

* Although FSL and LCWSL have an estimated total population of over 1,500 scientists and engineers, only 71 Phase I questionnaires were returned by these organizations. This small response limited the number of possible selections of respondents for the Phase II survey.

Characteristics of The Sample Population

6.24. R&D Activities and Responsibilities. Of the 175 respondents, 74 stated that their work primarily involved Applied Research (42%), 63 reported Applied Technology (36%), and 37 indicated Basic Research (21%). These results support the finding of the library survey that individuals in the applied sciences are more likely to use DTIC information resources than are those individuals in Basic Research.

6.25. Of the 175 respondents, 119 indicated that their primary role within their organization was to conduct "bench-level" R&D; 52 stated that their primary role was to supervise others conducting "bench-level" R&D (see Table 6.7).

TABLE 6.7
R&D ACTIVITIES AND DUTIES OF DETAILED END-USER SURVEY RESPONDENTS

Activities and Duties	Responses	
	Number	Percent
Principal R&D Activity:		
Basic research	37	21
Applied technology	63	36
Applied research	74	42
Other (or left blank)	1	1
Total	175	100
Primary Organizational Duty:		
Conduct "Bench-level" R&D	119	68
Supervise others conducting "bench-level" R&D	52	30
Other (or left blank)	4	2
Total	175	100

6.26. S&T Fields of Interest. The S&T fields of interest of the Phase II respondents are shown in Table 6.8. The table also shows the percentage of AMC work units found in these S&T fields in 1983. The distribution of scientists and engineers and work units among the S&T fields is fairly consistent. This consistency suggests that the S&T areas of interest of the Phase II survey respondents fairly accurately represent the interests of the Army R&D population in general.

Use of DTIC Resources

6.27. Reasons for Use. The 175 Phase II Survey respondents were asked to identify their reasons for use of DTIC information by selecting up to four items from a list of seven possible choices. Table 6.9 shows that the most frequent reason for use of DTIC information was "evaluation of the state of the art in S&T area," which was selected by 70% of the respondents. The second most commonly identified reason was "searching for new technology," which was selected by 57% of the respondents. These data show that scientists and engineers who use the DTIC Technical Report Data Base are exploiting its contents to find out what is going on in their S&T areas of interest and suggest that the STIP objective of promoting technology transfer is being furthered by DTIC.

6.28. The frequency of selection of other reasons for DTIC use shows that the data base contents are important for purposes other than technology transfer. These purposes include identification of others working in specific areas and checking out references for background research.

6.29. Extent and Nature of Use. The Phase II Survey respondents reported that, on the average, information from DTIC

TABLE 6.8
S&T FIELDS OF INTEREST IN ARMY R&D ACTIVITIES

S&T Field of Interest	% of Phase II Respondents In This Area	% of Work Units In This Area in 1983*
Aeronautics	6.9	7.6
Agriculture	0.2	0.1
Astronomy and Astrophysics	0.0	0.0
Atmospheric Sciences	1.2	2.8
Behavioral and Social Sciences	2.9	2.6
Biological and Medical Sciences	5.5	6.0
Chemistry	11.4	6.5
Earth Sciences and Oceanography	1.0	0.5
Electronics and Electrical Engineering	10.0	10.2
Energy Conversion (nonpropulsive)	1.9	1.1
Materials	11.7	8.8
Mathematical Sciences	5.0	1.5
Mechanical, Industrial, Civil, and Marine Engineering	7.9	3.6
Methods and Equipment	3.3	1.6
Military Sciences	4.3	5.6
Missile Technology	2.9	2.0
Navigation, Communications, Detection, and Countermeasures	4.0	7.5
Nuclear Science and Technology	2.4	0.6
Ordnance	6.0	13.2
Physics	9.8	9.6
Propulsion and Fuels	1.2	3.9
Space Technology	0.7	0.1

* Presearch Incorporated, Analysis of the Use of Foreign Intelligence by Research and Development Activities of the U.S. Army Materiel Development and Readiness Command, Technical Report No. 613, 5 August 1983, UNCLASSIFIED. Figures are based on 1,794 AMC work-unit summaries obtained from the active WUIS data base in March 1983.

TABLE 6.9
END USERS' REASONS FOR USING DTIC RESOURCES-- DETAILED END-USER SURVEY RESPONSES

Reasons for Using DTIC Resources	Respondents Citing the Reason*	
	Number	Percent
Evaluation of state of the art in S&T area	122	70
Searching for new technology	101	57
Identification of others working in specific S&T areas	83	47
Conduct of background research for IILR programs	81	46
Verification of references for background research	76	43
Demonstration of the uniqueness of an R&D Project	45	26
Other	15	9

* Respondents could choose more than one reason.

constitutes 28% of all the S&T information they use in their work. The respondents were asked a series of questions about their use of DTIC resources: how often they requested information, the number of requests made for different types of DTIC products, their use of DTIC's Current Awareness Bibliography service, and the amount of time they spend reading various types of documents received from DTIC resources. Table 6.10 summarizes the data received in answer to these questions. These data reveal the important part that DTIC plays in the work of the respondents. For example, the average respondent spends the equivalent of more than one work day per month reading documents obtained from DTIC, almost all of which are technical reports or technical report bibliographies. About 70% of end-users' requests for research support by their libraries include specific requests that DTIC resources be searched. Most of the responding scientists and engineers are aware that DTIC provides for dissemination of their work. Fifty-seven percent reported that their own reports have been submitted to DTIC for inclusion in the Technical Report Data Base.

6.30. Eighty-nine of the respondents reported that they use one or more Government or commercial current awareness services to learn about the availability of new literature in their areas of interest. Of these 89, 48 noted that they use the DTIC Current Awareness Bibliography service on a regular basis. It was noted in Table 6.10 that the "average" scientist or engineer spends about 0.5 hours per month reading CAB printouts. When the number of people who actually use CAB printouts is taken into consideration, it may be estimated that those who do use them spend about 2 hours per month reviewing these printouts. The expenditure of this amount of time on these products implies that their users are finding significant information.

TABLE 6.10
END USERS' USE OF DTIC INFORMATION PRODUCTS AND SERVICES

Information Item	Response
Number of responses to information requests that have included DTIC information during past year*	8.2
Number of requests for information made during past year that specifically required DTIC information*	5.7
Number of requests for DTIC products during past year:*	
Bibliographies	1.5
Technical Reports	7.0
Work Unit Summaries	0.9
Other Products	0.09
Hours per month spent reading DTIC products:**	
Current Awareness Bibliography	0.5
Other bibliographies	0.9
Technical Reports	7.7
Work Unit Summaries	0.5
Technical Abstract Bulletin	0.5
Other Products	0.1

Have you submitted technical report(s) to DTIC TR Data Base?

Response	Number	Percent
Yes	100	57
No	62	35
Left blank	13	8
	175	100

* For more detailed information, refer to Table G.5 in Appendix G.

** For more detailed information, refer to Table G.6 in Appendix G.

Evaluation of DTIC Information Resources and Services

6.31. **Ranking.** The Phase II Survey sample respondents were selected from those Phase I survey respondents who reported that they (1) use DTIC and (2) place a high value on the information and information services supplied by DTIC. In the Phase II questionnaire, a general evaluation of DTIC resources was once again solicited. The respondents were first asked to compare the value of DTIC resources with other sources of S&T information, by using a rating scale of "0" to "5," with 0 = not valuable and 5 = highly valuable. The average response was 3.9, with the most frequently cited response being 5. The question was then asked, "how satisfied have you been with the information you have obtained from DTIC resources?" The question was to be answered using a rating scale of "0" to "5," with 0 = not satisfied and 5 = highly satisfied. The average response was 4.2, again with the most frequent response being 5. The answers to these questions reflect the respondents' high appreciation of DTIC resources and services, and are consistent with the high value attributed to DTIC by most of the respondents in the Phase I Survey.

6.32. **Benefits Received.** The Phase II Survey respondents identified the general benefits obtained from their use of DTIC resources. This was done by indicating which benefits they attained by checking all applicable items in a list of possible benefits. The responses, shown in Table 6.11, present a clearer picture of the extent to which the potential benefits of DTIC use are being realized than did the corresponding question in the Phase I Survey. The reason is that the Phase II Survey asked the scientists and engineers to indicate all benefits they are deriving from use of DTIC resources, whereas the Phase I Survey requested the respondents to select only the one most

important benefit. (See paragraphs 6.12 through 6.17 and Table 6.4.) For this reason, the Phase II respondents could recognize both the value of data automation and the value inherent in the content of the information received. The data show that 75% of the respondents believe that the availability of DTIC resources saves them time required for accomplishment of their R&D projects and for location of information. Seventy percent of the respondents recognize DTIC's value as a unique information source that provides data unavailable elsewhere. About 50% of the respondents believe that DTIC prevents duplication of effort and stimulates new designs and methods. Although cost reduction is the least recognized benefit, it is still recognized as a benefit by 40% of the respondents.

TABLE 6.11

PHASE II EVALUATION OF BENEFITS OF DTIC INFORMATION RESOURCES

Benefits of DTIC Information Resources	Responses*	
	Number	Percent
Reduction in R&D Project Time	119	75
Reduction in Information Search Time	119	75
Unique Information Source	110	70
Prevention of Duplication of DoD R&D Efforts	85	54
Stimulation of New Designs/Methods	77	49
Cost Reduction	63	40
Other	3	2

* Respondents were allowed to select more than one response. The question was answered by 158 individuals.

6.33. Table 6.12 compares the Phase II Survey results with a ranking of the realized benefits of DTIC use based on the Phase I Survey results. The data from both surveys clearly suggest that those R&D scientists and engineers who become familiar with DTIC resources and services and the capabilities of their technical library to access these services on their behalf will probably consider them significantly valuable to their work.

TABLE 6.12
COMPARISON OF RESULTS WITH PHASE I SURVEY

Benefit of DTIC Information Resources	Ranking of Benefits	
	Phase II Survey	Phase I Survey
Reduction in R&D project time	1	4
Reduction in information search time	1	1
Unique information source	3	2
Prevention of duplication of R&D efforts	4	3
Stimulation of new designs/methods	5	6
Cost reduction	6	7
Other	7	5

6.34 **Reasons for Dissatisfaction.** As a part of their evaluation of DTIC resources and services, the Phase II respondents were given an opportunity to select reasons for possible dissatisfaction. This was done by asking them to identify as many factors as they wished from a list of possible problem areas. Only 85 respondents out of the total of 175 chose to answer this question, which indicates only about 50% felt strongly enough about possible problems to note them.

6.35. Table 6.13 shows the possible problem areas and the number of scientists and engineers who selected each one as an area of dissatisfaction. The most commonly noted problem was "slow distribution of hard-copy documents." As discussed earlier in this report, the distribution of hard-copy documents is largely dependent upon reproduction of the document at DTIC and use of the mail to transmit the document to its requestor. The most obvious solution to this problem is for the various laboratories and centers to obtain equipment which will enable them to reproduce or print out DTIC documents and on-line information locally. This could be done at a relatively nominal cost to any individual R&D laboratory.

TABLE 6.13
REASONS FOR DISSATISFACTION WITH DTIC INFORMATION OR SERVICES

Reasons	Responses	
	Number	Percent
Provides excessive bibliographic references	9	10
Provides insufficient bibliographic references	6	7
Slow distribution of hard-copy documents	27	31
Information not relevant to search topic	15	18
Information received not current enough	13	15
Other	15	18

6.36. Other problems indicated by some end users were the relevancy of the information returned and the return to the requestor of either excessive or insufficient numbers of bibliographic references to technical reports. Although these problems may be partially related to the adequacy of indexing of these documents, it may also result from the guidance that R&D personnel

provide to the technical information specialists who search the Technical Report Data Base for them. The more specific guidance the requestor provides for the DROLS operator, the more probable it is that the bibliography search will obtain references to relevant documents. Some requestors may also be unaware of the large number of citations in the Technical Report Data Base and thus be surprised when what seems to be a moderate request results in retrieval of several hundred bibliographic records.

6.37. Fifteen survey respondents selected "other" as an area of dissatisfaction with DTIC. Some of these responses were accompanied by the comment that the technical reports they received were of poor legibility. This situation is the result of several factors including the legibility of the original document received at DTIC, the equipment being used to produce microfiche copies at the time the document was received, and the proficiency of the equipment operator. DTIC is keenly aware of these factors and has a quality control program in effect.

6.38. **Time and Cost Savings**. One of the objectives of the Phase II Survey was to obtain as many estimates as possible about the amount of time and money saved by the availability of DTIC information. These questions were not answered by all of the respondents, many of whom commented that it was impossible for them to estimate such savings. The survey did obtain 113 estimates of time saved and 36 estimates of money saved by the availability of DTIC information.

6.39. Asked to estimate the number of weeks of work they saved during the past year by receiving information from DTIC, 113 respondents estimated a total of 496 weeks. Although it was not specifically stated in the question, the implication was that

this time saved represented man-weeks of the individual's time. If it is assumed that one man-year contains 48 man-weeks (allowing for vacation, sickleave, etc.), the 496 weeks saved equals 10.3 man-years. If it is further assumed that it costs the government $75,000 per year to support one scientist or engineer (probably a conservative estimate), the total savings to the government realized by the availability of DTIC resources to 113 R&D personnel would be $772,500, which is significant when it is remembered that the Army has approximately 11,000 R&D scientists and engineers. The extent to which the savings reported by this small sample can be generalized to the entire Army R&D population is a matter of conjecture. However, even if the savings to the Army are only 10 or 20 times that amount, it appears that the investment of additional money in computer terminals, printers, microfiche storage and reproduction equipment, and a few additional technical information specialists would have a significant return for the Army in terms of the increased effectiveness of its use of DTIC resources.

6.40. When asked to estimate the dollar savings associated with their use of DTIC resources over the past year, the scientists and engineers were more reluctant to venture information, many claiming they could not make such an estimate. The question did receive 36 responses, however. These 36 individuals estimated that DTIC information saved their projects a total of $502,500 during the past year, with the savings to any one project ranging from $160 to $200,000. As is the case with the estimated savings due to reduction of time required to accomplish R&D projects, how much the saving of $500,000 by 36 R&D personnel can be generalized to the entire Army R&D population is open to speculation. However, most observers would probably be willing to accept estimates in the tens of millions of dollars, far more

than the Army resources being expended on operations and support of DROLS and DTIC.

6.41 **Case Studies**. The Phase II questionnaire concluded by asking the respondents to describe specific situations in which the availability of DTIC resources had helped them accomplish their tasks. Eighty-seven people provided such information. Eight of these "case studies" are provided here. Some of the other interesting studies are contained in Appendix G.

Saved 26 weeks and $27,000:

"Our directorate completed a vulnerability study of airdrop aircraft. The information obtained [from DTIC] from studies and reports of other nations and services were invaluable. In some cases we found studies that had been completed on work we planned to do. It saved us from 're-inventing the wheel.'" (NRDC)

Saved 14 weeks and $200,000:

"DTIC's value to my work can be summed up by its two principal benefits: 1) exchange of information between services; 2) the superior quality of the information contained in many of the reports. Due to the classified nature of my work information exchange is difficult if not impossible. Research thrives upon technology transfer; without DTIC I would have no other listing of classified papers in my field. My current research on laser countermeasures provided several DTIC articles . . . that were extremely pertinent. Without these articles I would be working in a vacuum. DTIC articles provide information unavailable from any other source. DTIC . . . papers are an exceptional tool for my holographic research. Information is presented in these papers that I have never seen anywhere else." (NVEOL)

Saved 6 weeks and $10,000:

"Received user's manual on a large computer code developed elsewhere, which helped me write a more

efficient and accurate computer code for a related (but different) problem. This saved a good deal of time on a mission-critical project." (HDL)

Saved 7.5 weeks and $6,000:

"I was required to do a literature review of rifle test reports to determine why rifle performance is degraded. Much of the data of interest came from DTIC sources. Some of the reports were from the 50's and 60's and the authors had since left the government so that the DTIC reports provided the institutional memory. We also turned up some forgotten reports on rifle war games that proved very useful to our studies." (BRL)

Saved 2 weeks and $3,000:

"A new warhead development program was initiated in FY83. A DTIC information search revealed several previous attempts to design and demonstrate a multi-penetrator, kinetic energy warhead, but none of these programs demonstrated a warhead with satisfactory performance. A unique penetration release mechanism was designed and demonstrated in the new program which gives satisfactory warhead performance. The DTIC information search prevented the duplication of past efforts which were unsuccessful." (MICOM)

Saved 10 weeks' time:

"In support of a program, we have been conducting a study intended to reveal the differences in performance of visual limited tank-gun sights and IR sights when subjected to similar effects of adverse weather obscurants (snow, rain, fog, haze) and man-made obscurants (smoke, aerosols, combustion products). DTIC-furnished information has been a significant contribution in: a) providing a data base for preliminary calculations and initial analyses allowing us to better direct, or redirect, and use our limited resources, which was actually the case; b) providing data on atmospheric and environmental factors accumulated in tests of similar or related systems having some of the same operating characteristics as the system of interest, thus obviating the need for our generating the same data, and c) accessing sources of

data not otherwise available to us through the open literature." (BRL)

Saved 2 weeks' time:

"My current work involves, among other things, studies of involvement of nitrosamines involved in RDX decomposition. DTIC information on Russian work not otherwise available in English translation . . . has been very helpful in understanding the decomposition chemistry of these nitrosamines." (BRL)

Saved 4 weeks' time:

"[We] Required information on explosive bulge testing of weldments. It was known that the Navy uses this method for acceptance testing of welding procedures. Four reports were received in a short time. These reports provided information which permitted our project to be pointed in the right direction and eliminated unnecessary testing, thus reducing time to reach the desired objective." (TACOM)

Comments About DTIC By Army R&D Scientists and Engineers

6.42. To conclude this section, it seems appropriate to include some of the characteristic comments about the use of DTIC information resources and services that were made by the respondents.

"DTIC has been working for us to our advantage. We'd be lost without it. For us it has served best in providing information and data about weapons systems and weapon systems tests already accomplished. However, I would use the system more if I were able to search at the terminal by myself, rather than having a librarian do the searching for me. For us, searching is not usually highly specific. Useful information may pop up from strange sources. Just as the advent of the pocket calculator allowed us to do 'exploratory' calculations which we never would have done by slide rule we need to be able to do exploratory searches without the help of an operator--except for advice, assistance, and monitoring for proper

use. Some searches can be revealing without producing specific answers . . . ." (BRL)

"The [DTIC] services are valuable and necessary to me to provide timely relevant state-of-the-art information to me in an efficient and organized manner on ongoing, nationwide effort[s]/programs. If independently obtained, the information would cost me more time, money and effort than I would like to contemplate!" (ETDL)

"The DTIC service saves time in researching state-of-the-art subjects. Without this service a great deal of time and effort (much more than is current[ly] spent) will be needed to keep up to date in various areas of interest to this branch." (ETDL)

"The information we have obtained through DTIC has been helpful in highlighting technological approaches, evaluation methods, and conclusions drawn on a wide variety of aspects that comprise individual protection [against agents of chemical warfare and biological origin] . . . ." (NRDC)

"We feel that such a service [DTIC] is essential for any type of research. It is impossible to imagine attempting to perform research without it." (FSL)

"It is sad that DTIC services are underutilized. In my holographic research I have found several redundant contracts that asked for the equivalent contractual work but [were] sponsored by different agencies. If the responsible engineers had been more familiar with the technology (i.e. utilized DTIC services) several contracts would have been unnecessary. Valuable research funds should have been spent for new research objectives instead of paying a contractor twice to do the same thing for the Army and the Navy." (NVEOL)

"It would really be nice, if we had direct access [to DTIC] via our local computer terminals at our offices. While this may be too difficult for classified information, it would be helpful even for unclassified." (BRL)

"Many colleagues are unaware of DTIC services. You need to advertize DTIC." (CECOM)

VII. OBSERVATIONS, FINDINGS, AND RECOMMENDATIONS

STUDY SUMMARY

7.1. The purposes of the study were: (1) to investigate Army R&D use of the information resources and services provided by the Defense Technical Information Center under the DoD Scientific and Technical Information Program; (2) to assess the benefits that availability of these resources provide to Army R&D; (3) to identify any actions that may be taken by the Army to enhance the benefits it receives from DTIC; and (4) to assess the extent to which the Army labs provide R&D information to DTIC. The focus of the study was to obtain the perceptions of scientists and engineers about the usefulness of DTIC information.

7.2. The study methodology included (1) literature research, (2) in-person and telephone interviews with DTIC personnel, Army R&D technical information specialists, and R&D scientists and engineers, (3) questionnaire survey of Army R&D technical libraries, and (4) questionnaire survey of Army R&D scientists and engineers in 29 R&D laboratories and centers.

7.3. This section presents the observations and the findings and recommendations developed during the conduct of the study.

a. The observations provide general information that does not lead to recommendations for specific action by the Army. Although some of the observations may imply possible action by DoD or DTIC, it is not the purpose of this Army study to make recommendations to DTIC.

b. The findings and recommendations are based on information that suggests that Army Headquarters, its R&D commands, and/or its R&D centers and laboratories take action to make their use of DTIC resources more efficient and rewarding.

OBSERVATIONS

Realization of STIP Objectives

7.4. The availability of DTIC resources and services significantly assists the Army R&D Community to benefit from and contribute to the objectives of the DoD Scientific and Technical Information Program. The existence and accessibility of the DTIC automated data bases and Technical Report Collection are indeed providing for extensive interchange of information among Army scientists and engineers. **The benefits received include reduction of duplication of effort among the many, widespread Army R&D activities, reduction of the amount of time required to obtain information, identification of people working in the same technical areas, reduction in the time required to complete R&D projects, cost avoidance, and cost reduction.** The contribution of technical reports and Work Unit Summaries by Army R&D activities and their contractors to the DTIC data collection makes a large amount of Army technology available to other DoD elements and the many defense contractors, academic institutions, and research organizations who are DTIC users.

DTIC Is a Unique Information Source

7.5. The DTIC data collection is indeed a unique information source. Many Army R&D scientists, engineers, and information specialists rely on DTIC for information they cannot obtain elsewhere.

Army Technical Libraries Use DTIC Extensively

7.6. Approximately one-third of all technical library staff personnel in the 21 Army technical libraries that provided data for the study spend all or a significant part of their time on tasks involving use and support of DTIC resources. Some of the larger libraries expend several hundred man-hours per month using DTIC to support their patrons.

R&D Scientists and Engineers Use and Value DTIC Products

7.7. Survey response by about 3,200 Army R&D scientists and engineers in 25 laboratories and centers shows that 75% are aware of DTIC and that 60% use DTIC products. Of the almost 1,800 that reported using DTIC products, 83% rated the value of DTIC products to their work as being from moderate to high value. About 900 reported that they place high value on DTIC products.

Use of DTIC Resources is Saving the Army Time

7.8. Scientists and engineers who value DTIC resources highly were asked for detailed information on the benefits they obtained. A group of 113 scientists and engineers estimated that use of DTIC resources had saved them a total of over 10 man-years of effort during the past year. These estimates suggest that use of DTIC resources increased the productivity of the group by 9%. It may also be possible that the time savings helped the respondents to meet or reduce project schedules.

Use of DTIC Saves the Army Money

7.9. Although many survey respondents claimed they were unable to estimate dollars saved (it appears that most bench-level scientists and engineers are not immediately concerned with dollar management), estimates of cost savings for the past year from 36 respondents totaled $502,508. Based on the time savings reported in paragraph 7.8 and these reported cost savings, it is apparent that the availability of DTIC resources saves Army R&D a lot of money. The survey sample reporting time and cost savings represents about 1% of the total Army in-house population of scientists and engineers. If the reported savings of 10 man-years of effort for 1% of the population are multiplied only 20 times, 200 man-years of effort would be saved. If the yearly cost of paying and supporting one R&D professional is estimated to be $75,000 (a conservative estimate), the cost of 200 man-years of effort would be $15 million. Although the study did not include the cost to Army R&D of maintaining and processing DTIC data for Army use, it appears safe to estimate that the savings accrued to Army R&D by use of DTIC are at least $10 million per year and are probably more likely to be in the range of $40 to 50 million dollars per year.

DROLS Saves Time Required to Locate and Catalog Documents

7.10. The existence of the Defense R&D On-Line System for access to the DTIC data bases permits rapid search of almost 1.3 million document citations. Scientists, engineers, and technical information specialists value this capability highly. Some libraries use DROLS and the Technical Report Data Base to catalog their own in-house collections of technical reports, thus saving time that would otherwise be devoted to either manual cataloging or data entry for automated catalogs.

Accurate Indexing of Technical Reports Is Important

7.11. Reference data bases, such as the DTIC Technical Report Data Base, contain one record for each document cited. This record contains bibliographic information about the document, and, in the case of the Technical Report Data Base, an abstract and a number of descriptive terms that represent the substantive content of the document. The process of assigning these descriptive terms is called indexing. If enough terms are used to accurately and comprehensively represent the content of the referenced document, someone using descriptive terms to search the data base will be able to locate and retrieve relevant documents. If the descriptive terms in a record are inaccurate or incomplete, the searcher may never find documents that contain valuable information. The importance of thorough indexing is recognized by information specialists in the Army R&D Community and DTIC; however, it is probable that scientists and engineers not familiar with automated information systems may not appreciate its importance.

Army Input to DTIC Is Vital

7.12. To ensure that the DTIC Technical Report and Work Unit Information System Data Bases are complete and up-to-date, it is imperative that Army R&D organizations promptly provide DTIC with their technical and study reports, Work Unit Summaries, and other valuable S&T information such as translations of technical documents from foreign languages. In accomplishing these actions--as required by AR 70-9--the Army laboratories are primarily serving themselves by making information in their areas of interest readily retrievable.

Constraints Limit DTIC Capabilities

7.13. Although DTIC personnel and services are highly regarded by Army R&D information specialists (not one of the approximately 35 R&D technical information specialists contacted in 21 Army technical libraries was critical of DTIC's personnel or their desire to serve), they noted several factors (all long recognized by DTIC management and staff) that limit DTIC's capabilities.

a. The DTIC budget has constrained its capability to procure needed personnel and equipment, particularly in the data processing field. DTIC's computer hardware and software are old, and in the view of some Army users, do not provide the degree of "user friendliness" and efficiency found in some of the commercial systems. Improvement of this situation is very largely dependent on the funding provided to DTIC through DoD.

b. The legibility of some paper documents reproduced from DTIC microfilm (used to copy documents before August 1965) and microfiche is marginal. This situation is largely due to the quality of the original document and the microfilm or microfiche made from it. DTIC has an ongoing quality control program to deal with this problem; but as a practical matter it is impossible to recopy large numbers of old documents in the collection. Because it would be impossible for DTIC to store paper versions of thousands of reports they receive each year, DTIC retains original documents for only a short time after they have been copied on microfiche.

c. The DTIC Thesaurus of Terms is out of date. The currently available document, the DDC Retrieval and Indexing Terminology, was published in 1979 and does not contain many terms used in conjunction with new technologies. DTIC is now preparing a revised thesaurus.

d. The large volume of requests for DTIC documents and their transmittal by mail delays response time. During each working day of Fiscal Year

(FY) 1985, DTIC received an average of 1,237 requests for technical reports (68% for paper copy and 32% for microfiche) as well as numerous other requests for technical report bibliographies and Work Unit Summaries. Technical report bibliographies and Work Unit Summaries are printed by computer printers; technical reports themselves are reproduced on paper or microfiche. During FY85 the average time elapsed from the time a request for a technical report was received at DTIC until the document was mailed to the requestor was 5.2 days for paper copy and 2.1 days for microfiche. Transmission by mail to the requestor is commonly reported to require from 1 to 4 weeks.

Reorganization Causes Problems for Data Base Maintenance

7.14. Despite the merits, redesignation and reorganization of R&D elements creates additional work for DTIC data base maintenance personnel, if certain search and retrieval capabilities are to remain effective. For example, the DTIC computer has no way of automatically recognizing that BRL, which used to be under HQAMC, is now under LABCOM, or that ERADCOM no longer exists, unless someone writes programs to incorporate the changes into the computer system. While no one would suggest that the Army or other DoD elements should not reorganize to meet current functional and other requirements, it should be understood that the frequent creation, elimination, and redesignation of DoD elements cause significant increase in data base maintenance tasks if efficient and effective document retrieval capabilities from the DTIC data bases are to be maintained.

SPECIFIC FINDINGS AND RECOMMENDATIONS

7.15. In addition to the general observations made in the preceding paragraphs, the study effort resulted in a number of findings that suggest action by the Army-level R&D management,

by the R&D commands, the R&D laboratories and centers, and the technical libraries at the R&D laboratories and centers. The purpose of the recommended actions is to increase the effectiveness with which Army R&D organizations and individuals exploit and contribute to DTIC information resources and services. Increased effectiveness of Army R&D use of DTIC can be expected to have the following benefits for the Army:

a. Reduction in the amount of time required to complete R&D projects

b. Reduction in the cost of the Army R&D program and/or increased return on the Army investment in materiel research, development, and acquisition

c. Increased exchange of technology among Army R&D activities and with other users of the DTIC data bases and services

d. Cost avoidance by reducing the probability that work already completed may be duplicated

e. Greater access to information on the state of the art in technologies of interest to Army R&D

f. Decrease in the amount of time that R&D scientists must devote to data collection and increase in the amount of their time they can devote to original research and analysis.

7.16. The specific findings and recommendations derived from this study are presented in the following paragraphs. The first two findings are the widest in scope and require attention throughout the Army R&D establishment.

Finding and Recommendation Number 1

7.17. Finding 1. **Twenty-five percent of the scientists and engineers in the Army R&D laboratories and centers do not use DTIC resources and services because they do not know that DTIC exists.**

7.18. Discussion. Of 3,200 survey respondents, about 800 reported that they did not know that DTIC existed. If this percentage is generalized to the entire population of Army R&D scientists and engineers, it suggests that 2,500 to 3,000 do not know about DTIC. Although it may be possible that some of these people have used documents supplied by their technical libraries without realizing the original source was DTIC, the survey results do indicate that a large number of researchers are unaware of the DoD's central collection of R&D documentation and the potential benefits that exploitation of this resource may have for them.

7.19. The utility of informing scientists and engineers about DTIC resources is emphasized by the fact that of the 1,800 who do use DTIC information products, half report that these products are of high or very high value to their work.

7.20. The 25% unawareness of DTIC resources exists even though all technical libraries try to orient their users about the library resources (including DTIC) and despite the fact that several libraries have very active programs to inform users about DTIC products. The libraries could increase their efforts, but they need help. It is particularly important that management at the R&D command and the laboratory/center level emphasize the existence and usefulness of DTIC.

7.21. **Recommendation 1. That all levels of Army R&D management should expand their efforts to ensure that scientists, engineers, and their support personnel are:**

a. Oriented on the availability and benefits of DTIC information services

b. Required to search DTIC data bases for work already done before undertaking or sponsoring new R&D projects.

Finding and Recommendation Number 2

7.22. **Finding 2. Army R&D organizations are not fully contributing to the DTIC data collection.**

7.23. **Discussion.** Although hard survey data are not available, information specialists in Army technical libraries commonly believe that many technical reports and Work Unit Summaries that should be sent to DTIC are not submitted. The reasons for this are varied, but may be summed up as lack of management understanding of the important benefits of formal documentation and inattention to the provisions of Army Regulation 70-9. Previous study has shown that the submission of Work Unit Summaries and changes is particularly neglected, and there are suggestions that technical reports and translations frequently are not sent to DTIC. Librarians generally feel unable to correct this situation, since they can only process what they receive and are instructed to submit.

7.24. This situation has already been recognized by some Army R&D managers at the Army and major command level, and has been addressed in a letter from HQAMC to all R&D elements. [1/]

7.25. **Recommendation 2. That HQDA and the major commands amplify their supervision of the R&D laboratories and centers to ensure that S&T materials of interest to the Army and Defense R&D Community are submitted to DTIC as required by AR 70-9.**

Finding and Recommendation Number 3

7.26. **Finding 3. The Army can reduce time required for its DTIC users to receive paper and microfiche copies of DTIC reports, bibliographies, and Work Unit Summaries.**

7.27. **Discussion.** Most technical libraries with DROLS terminals lack adequate printers for output of large jobs such as long bibliographies. Use of slow printers for such documents ties up their terminal(s) for long periods of time and increases the probability that the communication line may be interrupted. Also, although some libraries maintain copies of DTIC technical reports on microfiche, they lack adequate equipment and staff to produce paper copies of these reports for distribution to their patrons. For these reasons, libraries commonly request DTIC to send paper copies of bibliographies and reports, with a resultant 1- to 4-week delay before the document is received.

7.28. Army R&D laboratories and centers could reduce the time it takes to receive DTIC documents to a matter of hours by procuring higher speed printers for their DROLS terminals and

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[1/] Letter, HQAMC, subj: Army Use of and Submission to the Defense Technical Information Center, 11 September 1985.

adequate equipment for paper reproduction of microfiche documents. With adequate equipment, most libraries could give a 1- or 2-hour response to requests for bibliographies and Work Unit Summaries and could reproduce most technical reports (except for very long ones) within a few hours. Libraries that receive frequent requests for very long technical reports might require additional staff to reproduce the reports.

7.29. Although the costs and benefits of upgrading equipment for use of DROLS will vary from laboratory to laboratory, with a minimal investment, [2/] most technical libraries could come close to eliminating their need to request hard-copy documents from DTIC and avoid the resultant delay in receiving them. (They would also not have to pay DTIC for reproduction of reports.) Given the benefits to be derived from providing information to requestors more quickly, it appears that money for equipment would be well spent. The improvement of library capability to print out or reproduce their own DTIC hard-copy documents would also greatly reduce the workload for DTIC.

7.30. Recommendation 3. **HQDA and the major R&D commands should instruct their laboratories and centers to investigate the costs and benefits of upgrading their equipment for interface with DROLS, and where warranted, procure improved printing capability and equipment for production of paper copies from microfiche.**

2/ For example, laser printers with a capability of 8 pages per minute are advertised for less than $8,000. Buffers that will store data to be printed and then send it to a printer, thus freeing the computer terminal for other use, are available for about $1,000. Also, the Army is now investigating the feasibility of transmitting microfiche images over telephone lines.

Finding and Recommendation Number 4

7.31. Finding 4. **Relatively few Army R&D scientists and engineers use the DTIC Current Awareness Bibliography service to learn of new acquisitions to the Technical Report Data Base.**

7.32. Discussion. Twenty-one Army technical libraries reported that a total of only 213 of the some 9,000 scientists and engineers they support are subscribers to the DTIC CAB service. The CAB provides a biweekly bibliography of new technical report acquisitions which are related to S&T areas of interest specified by the CAB user. The number of references the user receives will depend largely on the number of reports received by DTIC in different technical areas and on the specificity with which the user defines his or her area of interest. The user may then request the supporting technical library to obtain copies of any referenced document that is of interest.

7.33. It would appear that many more than 213 Army scientists and engineers would benefit from the CAB, if they knew about it and were instructed about procedures for establishing a users profile of information requirements.

7.34. Recommendation 4. **Laboratory management and the technical libraries should ensure that all R&D scientists and engineers are informed about the DTIC CAB and know local procedures for establishing their own CAB profile.**

Finding and Recommendation Number 5

7.35. Finding 5. **The Army can help improve the quality of indexing of technical reports in the DTIC collection.**

7.36. **Discussion.** Several Army DROLS terminal operators in the technical libraries are critical of the accuracy and completeness of the indexing of technical reports. They find that inaccurate and incomplete indexing limits their capabilities to locate and retrieve technical reports for their patrons. Three of the factors involved in this situation include: possible lack of attention to the assignment of subject terms by report authors who fill out the DD Forms 1473 submitted with the documents; the very large volume of documents received each day by DTIC for processing, including indexing, into the Technical Report Data Base; and the technical knowledge of the indexers at DTIC. Although a DTIC indexer reviews the subject terms on the DD Form 1473 submitted with each document and may add terms, it is impossible for the limited number of DTIC indexers to be expert in all the technologies discussed in the documents, and it is likely that they are not always able to recognize the significance of all the substantive content in the document.

7.37. The Army can assist DTIC in improving the quality of indexing in two ways. First, it can ensure that report authors understand the need to assign appropriate subject terms on the DD Form 1473 for a document. No one understands the importance of the information in a document better than its author, who should be required to take care in assigning subject terms on the 1473. Second, the libraries can help by participating in the Shared Bibliographic Input Network. The five Army libraries in the survey that participate in the SBIN all reported that their indexing of reports published by their laboratory facilitated the subsequent retrieval of these documents from the DTIC data base. Local information specialists are more aware of what is important in the technologies of interest to their laboratory than are indexers at DTIC and can assign more accurate terms. Library participation in the SBIN also reduces the workload on

DTIC indexers. Some libraries have some reservations, however, about SBIN participation due to the amount of time it requires on the part of their own staff. It seems that increasing the quality of technical report indexing, primarily for the benefit of the laboratory doing the indexing, would justify the augmentation of library staff to support the SBIN.

7.38. Recommendation 5. **Managers in the R&D laboratories and centers should ensure that technical report authors properly fill out the DD Forms 1473 submitted with their documents, especially block 18, "Subject Terms." Also, each R&D laboratory and center not currently participating in the SBIN should investigate the benefits to be gained from SBIN participation and the capability of its technical library to do so.**

Finding and Recommendation Number 6

7.39. Finding 6. **R&D scientists and engineers and library personnel need to work together to structure search strategies for search of the DTIC Technical Report Data Base.**

7.40. Discussion. The more specific guidance a patron can give when requesting information, the more likely it is that the technical information specialist will be able to retrieve relevant information from the Technical Report Data Base. Not all scientists and engineers recognize this factor and provide only very general guidance. All the technical libraries will ask users to expand on their information requests, if necessary. At least one library found it very helpful to have the patron present while the DROLS operator searched the data base. The availability of the patron facilitates the construction and execution of search strategy as the user learns how the DROLS

operator can look for information and sees the response to the search strategy.

7.41. **Recommendation 6. The R&D laboratories and centers should sponsor orientations on information search procedures for the scientists and engineers, with emphasis on the particular techniques found useful by the local technical library.**

CONCLUSION

7.42. This study clearly shows that the information stored and made available by DTIC has significant value to Army R&D; it is up to the Army to utilize the DTIC resources to meet the objectives of the Army Scientific and Technical Information Program and to contribute to these resources. The study also shows that all members of the Army R&D Community--managers, information specialists, and scientists and engineers--have equal and joint responsibility to support and use DTIC resources.

7.43. **Army R&D managers**--from HQDA on down--need to ensure that all concerned know how the use and support of DTIC can help the Army attain the objectives of the STIP described in AR 70-45. They should require R&D work units, study efforts, program managers, and other R&D activities to contribute to the DTIC data bases as required by AR 70-9. They should also understand that relatively small investment (in R&D terms) in the information support services provided by the technical libraries will reap large returns in terms of cost reduction and avoidance, savings in time, and transfer of technology throughout the R&D community in the Army and throughout DoD and its supporting contractors, universities, and research institutes.

7.44. **Information specialists** in the technical libraries need to continue to make every effort to ensure that their patrons are aware of DTIC and its services and the ways in which their libraries can exploit those services for their users. Libraries should be able to obtain up-to-date equipment that will enable them to reduce the time required to obtain hard-copy documents from DTIC and to have adequate staffs to use that equipment. Libraries need to participate to the fullest extent possible in DTIC programs and services such as Automatic Document Distribution, Shared Bibliographic Input Network, distribution of the Technical Abstract Bulletin, and promotion of the Current Awareness Bibliography service for its users.

7.45. **Individual bench-level scientists and engineers** have the ultimate responsibility for achievement of the STIP objectives and for the success of Army R&D. Given direction by management and support by the technical libraries, scientists and engineers must use and contribute to DTIC and other technical information programs and services. Some scientists and engineers have not yet recognized the extent to which DTIC resources and the technical libraries can help them in their R&D work. The many scientists and engineers who do recognize the value of DTIC information to Army R&D are represented by survey respondents who reported the benefits that DTIC use had for their own work, such as the individual who wrote the following:

> "DTIC is the daily newspaper and the historian of DoD-related research. Its product and service is unique. There is no other way to find out what is going on and what has gone on throughout all of DoD. The contribution in this regard is immeasurable because the product is essential (technical communication) and because there is no alternative source." (NVEOL)

APPENDIX A
ACRONYMS

A.1. This appendix defines all acronyms used in the technical report. They are listed in alphabetical order.

Acronyms

ADD	Automatic Document Distribution
AEFA	U.S. Army Aviation Engineering Flight Activity
AL	U.S. Army Aeromechanics Laboratory
AMC	U.S. Army Materiel Command
AMCCOM	U.S. Army Armament, Munitions, and Chemical Command
AMCLD	Office of the Deputy Chief of Staff for Technology Planning and Management, Headquarters, AMC
AML	Army Missile Laboratory
AR	Army Regulation
ARDC	U.S. Army Armament Research and Development Center
ARI	U.S. Army Research Institute for the Behavioral and Social Sciencles
ARL	U.S. Army Aeromedical Research Laboratory
ARO	U.S. Army Research Office
ASL	U.S. Army Atmospheric Sciences Laboratory
ATL	U.S. Army Applied Technology Laboratory
AVSCOM	U.S. Army Aviation Systems Command
BRDC	U.S. Army Belvoir Research and Development Center
BRDL	U.S. Army Medical Bioengineering Research & Development Laboratory
BRL	U.S. Army Ballistic Research Laboratory
CAB	Current Awareness Bibliography
CECOM	U.S. Army Communications-Electronics Command
COE	U.S. Army Chief of Engineers
CRDC	U.S. Army Chemical Research and Development Center

CRREL	U.S. Army Cold Regions Research and Engineering Laboratory
CRT	Cathode Ray Tube
CSTAL	U.S. Army Combat Surveillance & Target Acquisition Laboratory
DDC	Defense Documentation Center (now named Defense Technical Information Center)
DoD	Department of Defense
DRIT	DDC Retrieval and Indexing Terminology
DROLS	Defense RDT&E On-Line System
DTIC	Defense Technical Information Center (formerly named Defense Documentation Center)
ERADCOM	U.S. Army Electronics Research & Development Command
ETDL	U.S. Army Electronics Technology and Devices Laboratory
EWL	U.S. Army Electronic Warfare Laboratory
FSL	U.S. Army Fire Control and Small Caliber Weapon Systems Laboratory
FY	Fiscal Year
HDL	Harry Diamond Laboratories
HEL	U.S. Army Human Engineering Laboratory
HQAMC	Headquarters, U.S. Army Materiel Command
HQDA	Headquarters, Department of the Army
ILIR	In-house Laboratory Independent Research
IR&D	Independent Research and Development Data Base
LAIR	Letterman Army Institute of Research
LCWSL	U.S. Army Large Caliber Weapon Systems Laboratory
Med R&D Cmnd	U.S. Army Medical Research and Development Command

MICOM	U.S. Army Missile Command
MMRC	U.S. Army Materials and Mechanics Research Center
MRICD	U.S. Army Medical Research Institute of Chemical Defense
MRIID	U.S. Army Medical Research Institute of Infectious Diseases
NRDC	U.S. Army Natick Research and Development Center
NVEOL	U.S. Army Night Vision and Electro Optics Laboratory
ODCSPER	Office of the Deputy Chief of Staff for Personnel, HQDA
ODCSRDA	Office of the Deputy Chief of Staff for Research, Development, and Acquisition, HQDA
OLE	On-Line Edit
OTSG	Office of the Surgeon General, HQDA
R&D	Research and Development
RDTE	Research, Development, Test, and Evaluation
R&E	Research and Engineering
R&T	Research and Technology
RTL	U.S. Army Aviation Research and Technology Laboratories
SBIN	Shared Bibliographic Input Network
S&T	Scientific and Technical
STIP	Scientific and Technical Information Program
TAB	Technical Abstract Bulletin
TACOM	U.S. Army Tank Automotive Command
TR	Technical Report(s)
TROSCOM	U.S. Army Troop Support Command

WRAIR	Walter Reed Army Institute of Research
WUIS	Research and Technology Work Unit Information System

APPENDIX B
BIBLIOGRAPHY

B.1. This appendix contains references to documents pertaining to Army R&D activities, R&D documentation, and the Defense Technical Information Center resources, products, and services. All references are UNCLASSIFIED unless otherwise noted.

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APPENDIX C
STUDY PLAN

C.1. This appendix contains the study plan for Task 5 of Contract No. DAAD05-84-C-0189. The study plan describes the purpose, scope, background, and the methodology as originally planned for accomplishment of the study. As originally written, the study plan discussed investigation of DTIC use only in the Headquarters, AMC R&D centers and laboratories. During the initial investigation, unforeseen factors developed that required adjustment of the original methodology. A new method was needed to identify the DTIC end-user population, and the study sponsor decided that he wished to survey not only the AMC R&D centers and laboratories but to expand the survey to include all or most of the Army R&D Community. Therefore adjustments were made in the schedule of work and allocation of effort.

PRESEARCH INCORPORATED

STUDY PLAN FOR THE ANALYSIS OF AMC USE OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) DATA BASES

by

Robert V. Hubbard
and
Kathleen F. Zaccardo

November 29, 1984

Prepared for
Commander
U.S. Army Materiel Command
Alexandria, Virginia
Under
Contract No. DAAD05-84-C-0189

2361 South Jefferson Davis Highway
Arlington, Virginia 22202

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

PURPOSE

1.1 This study plan describes the methodology that Presearch Incorporated will use to analyze and report on the benefits of Defense Technical Information Center (DTIC) data bases to Army scientists and engineers in the Materiel Command (AMC) R&D laboratories and centers.

SCOPE

1.2 Section I of this document outlines the organization of the study plan, discusses areas of investigation, and provides the tentative organization of the technical report to be prepared at the end of the study.

1.3 Section II covers the following areas:

- Project team objectives
- Working relationships among AMC, DTIC, and Presearch
- Tasks to be completed
- Scheduling of work and allocation of effort
- Required deliverables--technical report
- Detailed description of tasks.

1.4 Section III discusses general administrative matters including the following:

- Work locations
- Security and handling of classified material
- Travel requirements
- Report format
- Study plan amendment.

BACKGROUND

1.5 AMC R&D centers and laboratories, as registered DTIC users, have access to all four data bases in the DTIC collection: the Research and Development Program Planning (R&DPP) Data Base, the Research and Technology Work Unit Information System (WUIS), the Technical Reports (TR) Data Base, and the Independent Research and Development (R&D) Data Base. AMC may access the data bases by manual means (written requests or telephone) or by remote terminals (dedicated or dial-up) connected to the Defense R&D On-Line System (DROLS). Although both AMC and DTIC maintain some statistics and records of accessions to the data bases, the benefits of these accessions to R&D personnel are largely undefined.

1.6 Presearch Incorporated will study and report on the benefits of use of DTIC data bases to AMC R&D scientists and engineers under the provisions of Task 5 of Contract No. DAAD05-84-C-0189. The contract became effective 1 August 1984 and will continue through 31 August 1985.

1.7 Presearch will publish its findings in a technical report to be delivered by 31 May 1985. The report will include such recommendations for Headquarters, AMC as the Presearch investigators may find appropriate. The technical report will be divided into five parts. Part I will be the Introduction, which will explain the purpose of the study and of the report. Part II will provide background information about AMC R&D activities and DTIC, and will explain the circumstances leading up to the study. Part III will describe the methodology used to conduct the study. Data collection and analysis will be covered in Part IV. The findings and recommendations of the Presearch team will be presented in Part V. Copies of the final report will be submitted to the Contracting Officer's Representative; Headquarters, AMC (attn: AMC-MI); the Army Technical Information Officer; and to DTIC. Other copies will be distributed as the Army Technical Information Officer may require.

II. METHODOLOGY

PROJECT TEAM OBJECTIVES

2.1 The project team has the following objectives:

- To define AMC procedures and resources for information input to and retrieval from DTIC data bases
- To identify DTIC data bank end users in AMC R&D centers and laboratories
- To quantify extent to which the selected end-user population utilizes DTIC data bases
- To identify purposes for which DTIC data bases are used
- To identify benefits of DTIC data bases to AMC end users
- To identify any problem areas in AMC use of DTIC data bases
- To publish findings and recommendations in a technical report.

WORKING RELATIONSHIPS AMONG AMC, DTIC, AND PRESEARCH

Coordination

2.2 The Presearch team conducting the study will coordinate

their efforts with representatives from AMC and from DTIC. The Contracting Officer's Representative (COR), Mr. Richard V. Miles, Headquarters, AMC will be informed of progress on the project through monthly reports and through informal contact. Progress reports will describe accomplishments of the preceding month, plans for the coming month, any problem areas, and will provide the remaining balance of the contract funds. DTIC also will be informed of progress, and of any problems or difficulties through informal verbal or written contact.

Designated Points of Contact

2.3 *Points of contact (POCs) for Headquarters, AMC and for DTIC* have been designated as follows:

Name	Organization	Telephone Number
Mr. Edward J. Kolb	Headquarters, AMC; Directorate for Technology Planning and Management	(202) 274-8671
Mr. Richard V. Miles	Headquarters, AMC; Office of the Deputy Chief of Staff for Intelligence	(202) 274-7082
Mr. Robert Chaillet	Headquarters, AMC; Directorate for Development, Engineering, & Acquisition	(202) 274-9855
Mr. R. Paul Ryan	AMC, Ballistic Research Laboratory; Scientific and Technical Information Branch	(301) 278-2125
Mr. Allan Kuhn	DTIC; Office of Planning & Management	(202) 274-6886

Mr. R. Paul Ryan has been designated a special consultant to the project and will be available to provide technical advice to the study team as may be required.

Mr. Allan Kuhn has designated the following individuals as DTIC divisional points of contact to provide assistance to the Presearch team in the collection of needed statistics and records:

Name	Division	Telephone Number
Mr. Ed Thorpe	Directorate of Telecommunications and ADP Systems (On-line data base searches and orders)	(202) 274-7082
Mr. Fuller Murfree	Directorate of Data Base Services (Manual requests for bibliographies and reports)	(202) 274-7206
Mr. Lou Williams and Ms. Jane Hatton	Directorate of Data Base Services (Current Awareness Bibliography program)	(202) 274-7206
Ms. Crystal Ashton	Directorate of Document Services (User registration)	(202) 274-6871

Points of contact at all technical information facilities (TIFs) which support one or more of the 20 AMC R&D centers and laboratories included in the study will be established by the Presearch team as the study progresses. A list of all points of contact for the TIFs investigated will be compiled and included in the final technical report.

TASKS TO BE COMPLETED

2.4 The study has been divided into five main tasks which correspond to the phases of the investigation. Each task has been subdivided into subtasks as shown in the following list:

- **Task 1. Plan:**
  - 1.1 Allocate and schedule time and effort
  - 1.2 Conduct initial discussions with personnel at AMC and DTIC to establish points of contact
  - 1.3 Define study objectives and develop methodology
  - 1.4 Write study plan
  - 1.5 Prepare tentative report outline
- **Task 2. Conduct Initial Research:**
  - 2.1 Learn DTIC procedures, data bases (content analysis), and DROLS operation

- 2.2 Investigate AMC usage of DTIC data bases to identify end-user population
- 2.3 Research Army regulations and other documents on R&D data bases
- 2.4 Investigate procedures (operations) relating to use of DTIC by Headquarters, AMC and R&D centers and labs
- 2.5 Identify detailed variables and data to be collected

- **Task 3. Collect Data:**
  - 3.1 Develop, review, and test interview schedules and questionnaires and arrange through AMC to notify end users of project
  - 3.2 Conduct interviews, distribute and administer questionnaires, and collect responses
  - 3.3 Prepare data for processing and analysis

- **Task 4. Analyze Data:**
  - 4.1 Aggregate data and run statistical tests
  - 4.2 Develop and list findings by looking for trends
  - 4.3 Develop and list recommendations

- Task 5. Prepare Report:
  - 5.1 Prepare detailed report outline
  - 5.2 Write report
  - 5.3 Publish report.

SCHEDULE OF WORK AND ALLOCATION OF EFFORT

2.5 The schedule of work and allocation of effort are summarized in Figure 2.1.

2.6 The total contractor effort allocated to this study is 1,165 hours of professional labor and 250 hours of technical support.

2.7 The project team members are Mr. Robert V. Hubbard and Ms. Kathleen F. Zaccardo. Mr. Hubbard will manage the performance of the tasks and will participate with Ms. Zaccardo in their execution. The study team will be able to draw on Presearch staff resources for programming and technical support as necessary.

DETAILED DESCRIPTION OF TASKS

Task 1: Plan

2.8 The planning phase of the study provides the schedule and methodological framework within which the investigation will be

Task and Step No.	Task and Step Description	Project Schedule										Estimated % of Total Effort	Estimated Total Effort in Man-hours*
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May		
1	**PLAN**											13%	180
1.1	Allocate and schedule time and effort												
1.2	Conduct initial discussion with study coordinators and sponsors to establish POCs and COR												
1.3	Define objectives and develop methodology												
1.4	Write study plan and tentative report outline												
2	**CONDUCT INITIAL RESEARCH**											24%	345
2.1	Learn DTIC procedures, data bases, DROLS												
2.2	Investigate AMC usage of DTIC data bases to identify end-user population												
2.3	Research Army regulations and other documents												
2.4	Research AMC procedures at Headquarters and at local commands and labs												
2.5	Identify data to be collected												
3	**COLLECT DATA**											28%	400
3.1	Develop, review, and test interview schedules and questionnaires												
3.2	Conduct interviews, distribute questionnaires, and collect responses												
3.3	Prepare data for processing and analysis												
4	**ANALYZE DATA**											15%	200
4.1	Aggregate data and run statistical tests												
4.2	Develop and list findings by looking for trends												
4.3	Develop and list recommendations												
5	**PREPARE REPORT**										▲	20%	290
5.1	Prepare detailed outline												
5.2	Write report												
5.3	Publish report												

* Includes Technical Support
▲ Deliverable

FIGURE 2.1

SCHEDULE OF WORK AND ALLOCATION OF EFFORT

conducted and culminates with the development of this study plan and a tentative outline of the technical report. Based on their preliminary research and on initial discussions with the study coordinators and points of contact at AMC and at DTIC, the Presearch team has expanded the investigative methodology presented in Task 3 of Presearch Incorporated Proposal No. 937-20. The report outline will follow the standard format for an investigative report.

Task 2: Conduct Initial Research

2.9 Initial research will allow the study team to confirm and finalize detailed plans and procedures for conducting the study. It will allow the team to identify detailed variables pertinent to the study and will therefore identify specific data to be collected. The team will make several visits to DTIC to learn DTIC procedures for conducting bibliographic searches and for distributing search information and documents. A content analysis will be made of the data bases. To acquire detailed knowledge of on-line information retrieval, Ms. Zaccardo will take a DROLS users' training course.

2.10 Statistics maintained by DTIC relating to AMC usage of DTIC data bases will be examined to assist the study team in identifying the DTIC data base end-user population within AMC. Based on the information obtained from these statistics, the Presearch team will select a representative sample of AMC R&D organizations from the population and will conduct a survey. Interviews and questionnaires will be used to survey the sample.

2.11 Visits to Headquarters, AMC and east coast R&D centers and labs will be made so that the study team may investigate procedures and operations within AMC technical information facilities. Relevant Army regulations governing use of DTIC data bases and other documents relating to R&D data bases also will be researched.

Task 3: Collect Data

2.12 Data will be collected for the sample survey by conducting interviews with end users at local AMC centers and labs and by distributing and administering questionnaires to other end users. Prior to distribution, questionnaires will be reviewed and tested. As questionnaire responses are collected from end users, the data will be prepared for automatic processing and analysis.

Task 4: Analyze Data

2.13 All data collected and coded for processing will be entered into appropriate data files. Through the use of an available statistical software package, data will be aggregated and simple statistical tests will be performed. The results of the data analysis, along with verbal comments appearing on questionnaires, will be examined to look for trends. The effects of variables such as the following will be considered:

- Influence of type of DTIC access (dedicated, dial-up, telephone, written request)
- Timeliness of responses from DTIC to requests from AMC personnel
- Technical support/operator expertise in using DROLS and knowledge of DTIC data bases
- Data base content and currency, keywords, thesaurus, etc.
- End-user awareness of and familiarity with DTIC resources
- Computer-related equipment and technology available
- Field or discipline of user

Task 5: Prepare Report

2.14 The output of the data analysis will be a technical report describing the findings of the Presearch study and providing such recommendations to Headquarters, AMC as the study team and the COR find appropriate. Recommendations made will generally deal with ways in which AMC organizations may more effectively use the information resources available from DTIC. A detailed outline of the report will be developed as the study progresses and will be completed prior to the writing and publication of the report.

OUTLINE OF THE TECHNICAL REPORT

2.15 A tentative outline for the technical report is shown in Figure 2.2. This outline is an expansion of the report description provided in Subsection 1.7.

Section 1. **INTRODUCTION**

- 1.1 Purpose of the study
- 1.2 Organization of the report
- 1.3 Scope of the study

Section 2. **BACKGROUND**

Section 3. **METHODOLOGY**

- 3.1 General
- 3.2 Planned methodology
- 3.3 Actual methodology

Section 4. **DATA COLLECTION AND ANALYSIS**

- 4.1 Description of end-user population and sample selection process
- 4.2 Discussion of detailed variables considered
- 4.3 Discussion of data collected and description of interviews and questionnaires
- 4.4 Discussion of responses and trends discovered
- 4.5 Description of measures of value applied to DTIC information resources
- 4.6 Description of measures of effectiveness used to evaluate benefits of DTIC data bases to AMC end users
- 4.7 Survey results--trends observed

Section 5. **OBSERVATIONS AND RECOMMENDATIONS**

--benefits and shortcomings of DTIC data bases vis-a-vis the information requirements of AMC R&D laboratory end users.

FIGURE 2.2
TECHNICAL REPORT OUTLINE

III. ADMINISTRATIVE MATTERS

GENERAL

3.1 This section provides general information on administrative matters such as work location, security and handling of classified materials, travel requirements, report format, and amendment of the study plan.

WORK LOCATION

3.2 The project team primarily will use the resources and facilities of Presearch Incorporated. However, some data collection tasks, such as gathering data from DTIC records on data base usage by AMC organizations and interviewing AMC end users, will be performed at DTIC, and at AMC centers and labs. Coordination of the investigation with AMC and DTIC will require frequent meetings at Headquarters, AMC and at DTIC.

SECURITY AND HANDLING OF CLASSIFIED MATERIALS

3.3 Classified materials will be handled in accordance with appropriate DoD and Army regulations and procedures, as well as with the Presearch Security Policy and Procedures manual, which provides Presearch employees with instructions for security implementation. The Presearch Security Office will control classified materials received or transmitted by Presearch and

will ensure that all classified materials stored at Presearch receive proper protection. Presearch has facilities approved for storage of material up to and including TOP SECRET codeword information. The Presearch Security Office will pass clearances as required to support visits of project team personnel to DTIC and to AMC facilities.

TRAVEL REQUIREMENTS

3.4 In addition to extensive local travel in the Washington, D.C. area, the project team foresees the need to visit AMC centers and labs in the vicinity of Washington, D.C. One or two day trips will be made to locations such as Aberdeen Proving Ground, Maryland; Fort Belvoir, Virginia; and Adelphi, Maryland to investigate AMC procedures and to interview TIF personnel and DTIC data base end users. Several trips to the Ballistic Research Laboratory (BRL) at Aberdeen Proving Ground will be scheduled to enable the project investigators to consult with Mr. R. Paul Ryan, the past President of the DROLS User Council.

REPORT FORMAT

3.5 The format of the final technical report will conform to the style standards outlined in the Presearch Style Manual.

AMENDMENT OF THE STUDY PLAN

3.6 As of the date of its writing, this study plan represents the projects team's approach to the design of a structured

investigation and the writing of a technical report based on that investigation. The plan lays out a map for the progress of nine months' effort. As the study progresses, the team will elaborate and alter the plan to accommodate eventualities that cannot be foreseen. When situations requiring substantive procedural modification occur, the investigators will promptly notify the AMC Contracting Officer's Representative so that the Presearch team and AMC representative may agree upon the changes that should be implemented. These changes may be documented by memoranda of understanding.

APPENDIX D

SURVEY MATERIALS FOR SCIENTIFIC AND TECHNICAL LIBRARIES AND INFORMATION CENTERS

D.1. This appendix contains the survey materials for the Army technical libraries, including an explanatory cover letter, the library survey distribution list, instructions for completing the questionnaire, and the questionnaire itself.

D.2. Library Survey materials were forwarded to libraries through designated points of contact at the R&D centers and laboratories.

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA. 22333

AMCLD

25 March 1985

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army Technical Libraries to Support R&D Centers and Laboratories

SEE DISTRIBUTION

1. The Army is continually concerned that R&D scientists and engineers receive the most effective scientific and technical (S&T) information support possible. Headquarters, AMC, has responsibility to "coordinate administration and execution of the STIP" (Scientific and Technical Information Program Ref. AR 70-45, Section II, 11.) AMC is concerned with assuring effective technical communication in their "coordination" role and has recently initiated a review of the use of the Defense Technical Information Center (DTIC) resources by Army R&D scientists and engineers. Our goal is to recognize and enhance the effectiveness of Army use of DTIC information resources and services. The specific objectives of the review are the following:

a. To obtain hard data about the extent to which "bench-level" R&D people use DTIC information and services,

b. To identify the benefits to Army R&D accruing from the availability of DTIC resources,

c. To elicit suggestions for improvement of Army usage of DTIC information resources.

2. To obtain needed data, Headquarters, AMC is inquiring about the use of DTIC resources by the technical libraries and scientists and engineers in the Army R&D centers and laboratories. The inquiry will be conducted in two phases. During the first phase, the libraries will be asked to provide data on library resources and procedures for processing DTIC information, and each laboratory's population of bench-level scientists and engineers will be questioned to collect data on the extent of DTIC usage. After the results of Phase I have been received and processed, a sample of DTIC users will be selected for Phase II of the survey. This second sample group will then be asked to provide specific information about the benefits of DTIC resources to their work. Since your information center or library acts as an intermediary between the R&D people and DTIC, we would like you eventually to assist us with the conduct of Phase II of the inquiry.

AMCLD

Subject: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army Technical Libraries to Support R&D Centers and Laboratories

3. Materials for Phase 1 of the inquiry (which have been tested by selected technical information specialists) are enclosed and include a questionnaire concerning library procedures for processing DTIC information and instructions for completing the questionnaire. The firm of Presearch Incorporated has been contracted to perform services (such as data processing) in conjunction with this inquiry. The completed questionnaires are to be returned to Presearch Incorporated, ATTN: DTIC Study, 8500 Executive Park Avenue, Fairfax, Virginia 22031 no later than 26 April 1985.

4. We wish to emphasize that these data will not be used to evaluate the S&T information centers and libraries or individual personnel. The data are needed to estimate the extent of Army use of DTIC resources. We will keep you apprised of the reviews progress and will be happy to share its findings with you upon completion.

5. POC for coordination and sponsorship of this effort is Jack Kolb, AUTOVON 284-8671.

Jack Kolb

1 Enclosure
ajs

JACK KOLB
Principal Army Technical
Information Officer

AMCLD

Subject: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army Technical Libraries to Support R&D Centers and Laboratories

Dir, Walter Reed Army Institute of Research, ATTN: LIB DIR/ V. L. Gera, Washington, DC 20307

Cdr, US Army Aeromedical Research Laboratory, ATTN: SGRD-UAX-SI/ Ms. Sybil H. Bullock, Ft. Rucker, AL 36362-5000

Cdr, Letterman Army Institute of Research, ATTN: SGRD-ULZ-L/Ms. Nancy Thorne, Presidio of San Francisco, CA 94129-6800

Cdr, US Army Medical Research and Development Command, ATTN: SGRD-RMS/Ms. Dixie Daymont, Ft. Detrick, Frederick, MD 21701

Cdr, US Army Medical Research Institute of Chemical Defense, ATTN: SGRD-UV-AW/Ms. P. Pepin, Aberdeen Proving Ground, MD 21010

Cdr, US Army Research Institute of Infectious Diseases, ATTN: SGRD-UIA-L/R.S. Janssen, Ft. Detrick, Frederick, MD 21701

Dir, US Army Research Office, ATTN: AMXRO-IP-LIB/Mr. Richard O. Ulsh, P.O. Box 1211, Research Triangle Park, NC 27709-2211

Cdr, US Army Research Institute for the Behaviorial and Social Sciences, ATTN: PERI-POT-I/Ms. Arlene D. Blose, 5001 Eisenhower Avenue, Alexandria, VA 22333

Cdr, US Army Cold Regions and Engineering Laboratory, ATTN: CRREL-TI/Mr. W. Pietkiewicz, Hanover, NH 03755

Dir, US Army Materials and Mechanics Research Center, ATTN: AMXMR-PL/Ms. M. Murphy, Watertown, MA 02172

Cdr, US Army Applied Technology Laboratory, ATTN: SAVDL-ATL-TSC-LIB, Ft. Eustis, VA 23604

Cdr, US Army Armament Research and Development Center, ATTN: SMCAR-TSS/Mr. N. L. Varieur, Dover, NJ 07801

Dir, US Army Aviation Research and Technology Laboratories, ATTN: SAVDL-POM/Ms. Dorothy Brookman, Ames Research Center, Moffet Field, CA 94035

Dir, US Army Ballistic Research Laboratory, ATTN: AMX-OD-ST/ Ms. Louise Letendre, Aberdeen Proving Ground, MD 21005

Cdr, US Army Belvoir Research and Development Center, ATTN: STRBE-WC/Ms. Gloria James, Fort Belvoir, VA 22060

AMCLD

Subject: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army Technical Libraries to Support R&D Centers and Laboratories

Cdr, US Army Armament Research and Development Center--LCWSL, Benet Weapons Laboratory, ATTN: AMDAR-LCB-TL, Watervliet, NY 12189

Cdr, Chemical Research & Development Center, ATTN: SMCCR-SPS-L/Ms. Concetta Anaclerio, Aberdeen Proving Ground, MD 21010

Cdr, US Army Communications and Electronics Command, ATTN: AMSEL-ME-PSL/M. E. Clinton, Ft. Monmouth, NJ 07703

Cdr, US Army Electronics Research and Development Command, ERADCOM Technical Support Activity, ATTN: DELSD-L-STINFO/ Mr. William Werk, Ft. Monmouth, NJ 07703

Dir, Harry Diamond Laboratories, ATTN: DELHD-TA/Ms. Barbara McLaughlin, 2800 Powder Mill Road, Adelphi, MD 20783

Dir, US Army Human Engineering Laboratory, ATTN: DRXHE-SS/Ms. Joyce Watlington, Aberdeen Proving Ground, MD 21005

Cdr, US Army Missile Command, ATTN: AMSMI-RPR/Ms. Nancy Stilson, Redstone Arsenal, AL 35898

Cdr, US Army Natick Research and Development Center, ATTN: STRNC-DT, Natick, MA 01769

Cdr, US Army Tank Automotive Command, ATTN: AMSTA-TSL/ Mr. Leon Burg, Warren, MI 48090

AMCLD

REVIEW OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) RESOURCES BY SCIENTIFIC AND TECHNICAL LIBRARIES IN THE ARMY R&D CENTERS AND LABORATORIES

25 March 1985

INTRODUCTION/INSTRUCTIONS

INTRODUCTION

As Chief of a technical library which supports Army R&D laboratories, you are being asked to participate in a Headquarters, AMC review of the use of Defense Technical Information Center (DTIC) resources by scientific and technical (S&T) libraries. This review is part of a larger review of the use of DTIC resources by Army R&D scientists and engineers being conducted by Headquarters, AMC. The objective is to obtain hard data on the extent of DTIC usage by the R&D community and to identify the benefits of DTIC support to Army R&D.

We are reviewing selected scientific and technical libraries to obtain information about:

- o The enduser population in R&D centers and laboratories supported by the selected S&T libraries
- o Library resources and procedures for interfacing with DTIC and with endusers
- o The value of DTIC resources to the library
- o Endusers' usage and perceived value of DTIC information.

We are especially interested in your perceptions of endusers' information needs, their reasons for requesting information, the purposes for which they use it, and their comments about the value of information obtained from DTIC to Army R&D.

Your cooperation in completing this questionnaire is essential if we are to obtain information needed to support the allocation of resources for DTIC services and to enhance Army use of DTIC services. We will be happy to share our findings with you upon completion of the review.

INSTRUCTIONS

Please read these instructions carefully and review the questionnaire. You may complete the questionnaire or may designate a member of your staff to do so, but the questionnaire should be completed by the individual who is most knowledgeable about the day-to-day use of DTIC resources at the library.

The questionnaire is divided into two parts. Part I requests identifying information about the respondent. Part II requests substantive information and contains a total of 32 questions which are logically organized into four groups identified by subheadings. Most of the questions are multiple choice to reduce the time required to answer them and to facilitate automated processing. Space is provided for comments that a respondent may wish to add.

Each question should be carefully reviewed before it is answered. Some of the questions request data of a statistical nature. Although you may not have statistics available, please provide your best estimate of the value(s) requested. Do not spend any length of time calculating or developing these data.

Please return Parts I and II of the questionnaire to Presearch Incorporated, Attn: DTIC Study, 8500 Executive Park Avenue, Fairfax, VA 22031 so that it arrives no later than 26 April 1985. After your completed questionnaire is received, your respondent may be contacted by telephone to follow up on questionnaire responses.

REVIEW OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) RESOURCES BY SCIENTIFIC AND TECHNICAL LIBRARIES IN THE Army R&D CENTERS AND LABORATORIES

25 March 1985

QUESTIONNAIRE

Part I. Questionnaire Identification

Please enter the respondent's name, title, address, telephone numbers, and the date the questionnaire was completed. Then go on to complete Part II.

Name of Respondent: _____

Title of Respondent: _____

Respondent's Address and Office Symbol: _____

_____

_____

Respondent's Telephone Numbers:
Commercial _____ Autovon _____

Date questionnaire completed: _____

Part II. Questions and Answers

A. Information About Supported Army R&D Activities

1. How many scientists and engineers are there at the principal laboratory or laboratories the library supports? (Please estimate) _____

2. What percentage of these personnel are involved in:

   a. Basic research _____%

   b. Applied technology _____%

3. What do you estimate is the percentage of scientists and engineers at the laboratory who use DTIC information resources provided by the library? _____%

4. List the Army R&D activities, which the library supports, and estimate the number of scientists and engineers employed by these activities who use DTIC resources provided by the library:

	ACTIVITY	APPROXIMATE NO. OF DTIC USERS
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

B. Information About Library Resources for Use of DTIC

5. a. What is the total number of personnel on the library staff? _____

b. How many of these staff members devote a significant portion of their time to tasks involving use of DTIC resources? _____

c. About how many manhours per month does the staff devote to use of DTIC resources? ("Use of DTIC resources" refers to tasks such as searching DTIC data bases, requesting DTIC documents, indexing and/or cataloging DTIC documents)

_____ manhours

6. a. How many library staff members operate Defense RDT&E On-Line System (DROLS) terminals to access DTIC data bases? _____

b. How many of these individuals have received DTIC retrieval training on DROLS? _____

c. How many years experience do they each have in searching DTIC data bases?

Operator Number 1 _____ years
Operator Number 2 _____ years
Operator Number 3 _____ years
Operator Number 4 _____ years
Operator Number 5 _____ years
Operator Number 6 _____ years

7. If you have more than one terminal on your site, are the terminals used for different purposes?

_____ a. Yes _____ b. No

NOTE: If you checked 7a above, go on to question 8.
If you checked 7b, skip question 8 and go on to question 9.

8. Describe the different purposes referred to in question 7:

_____

_____

_____

_____

_____

_____

_____

9. Does the library use the DROLS to supplement manual cataloging capabilities?

_____ a. Yes _____ b. No

C. Information About Library Procedures for Interfacing With DTIC and With Endusers

10. Is DTIC Technical Report (TR) indexing usually adequate for your purposes?

_____ a. Yes _____ b. No

11. Have you had any of the following problems with TR indexing? (Check all relevant statements)

_____ a. indexing is too general
_____ b. DTIC thesaurus is difficult to use
_____ c. quality of indexing is inconsistent
_____ d. no problems experienced
_____ e. other (specify below)

_____

_____

_____

_____

12. Does the library catalog or index TRs for the Shared Bibliographic Input Network (SBIN)?

_____ a. Yes _____ b. No

NOTE: If you checked 12a above, go on to question 13.
If you checked 12b, skip question 13 and go on to question 14.

13. Has the library's participation in the SBIN program improved capability to locate TR's in the DTIC TR data base?

_____ a. Yes _____ b. No

14. Does the library have a significant portion of the DTIC TR collection in microform?

_____ a. Yes _____ b. No

NOTE: If you checked 14a above, go on to question 15.
If you checked 14b, skip question 15 and go on to question 16.

15. Does the library use microform copies of TRs to print out locally hard copies of TRs?

_____ a. Yes _____ b. No

16. How does the library obtain hard copy bibliographies from DTIC data bases? (Estimate the percentages that are obtained by the methods listed below. Estimates must total 100%)

_____% a. print out locally
_____% b. order from DTIC on-line
_____% c. order from DTIC off-line (by telephone or in writing)
_____% d. other (specify below)
100% = Total

_____

_____

17. How does the library obtain hard copies of Work Unit Summaries? (Estimate the percentages that are obtained by the methods listed below. Estimates must total 100%)

_____% a. print out locally
_____% b. order from DTIC on-line
_____% c. order from DTIC off-line (by telephone or in writing)
_____% d. other (specify below)
100% = Total

_____

_____

18. a. What do you perceive to be the primary benefit(s) for the library of using DTIC resources?

b. What do you perceive to be the major problem(s) for the library, if any, in using DTIC resources? (Explain below)

c. What are your recommendations for solution of the problems cited in question b above?

19. Does the library have a specific means of informing endusers about information and information services available from DTIC?

_____ a. Yes _____ b. No

NOTE: If you checked 12a above, go on to question 13.
If you checked 12b, skip question 13 and go on to question 14.

20. Briefly describe the method(s) the library uses to inform endusers of DTIC resources:

21. How are user profiles for the DTIC Current Awareness Bibliography (CAB) program handled for the R&D activities the library supports? (Check all appropriate statements, and indicate the number of profiles maintained using that method).

_____ a. Separate profiles are maintained for individual endusers. If so, how many? _____

_____ b. Separate profiles are maintained for each laboratory or division. If so, how many? _____

_____ c. Separate profiles are maintained for each work unit. If so, how many? _____

_____ d. Not applicable, our library does not use the DTIC CAB program.

_____ e. Other (specify method and number below)

_____

_____

22. How are user profiles for the DTIC Automatic Document Distribution (ADD) program handled for the R&D activities the library supports? (Check all appropriate statements, and indicate the number of profiles maintained using that method).

_____ a. Separate profiles are maintained for individual endusers. If so, how many? _____

_____ b. Separate profiles are maintained for each laboratory or division. If so, how many? _____

_____ c. Separate profiles are maintained for each work unit. If so, how many? _____

_____ d. Not applicable, our library does not use the DTIC ADD program.

_____ e. Other (specify method and number below)

_____

_____

23. What percentages of all enduser requests for information are submitted to the library in the following forms? (Estimates must total 100%)

_____% a. submitted in writing

_____% b. submitted orally over the telephone

_____% c. submitted orally during a personal visit to the library

_____% d. other (specify below)

100% = Total

_____

_____

24. What percentage of all enduser requests for information involve use of DTIC resources by the library staff? _____%

25. How often does a library staff member hold a personal interview with an enduser to discuss search criteria after receiving a request?

___ a. Always ___ b. Usually ___ c. Sometimes ___ d. Never

26. How often are endusers present to review the results as the library staff member is conducting the search at a DROLS terminal?

___ a. Always ___ b. Usually ___ c. Sometimes ___ d. Never

D. Information About Endusers' Usage of DTIC Information

27. How often do endusers specifically ask the library to search DTIC data bases when they submit a request for information?

___ a. Always ___ b. Usually ___ c. Sometimes ___ d. Never

28. What are the most frequent reasons given by endusers for requesting information from DTIC data bases? (Check up to four reasons)

_____ a. to conduct background research for Inhouse Laboratory Independent Research (ILIR) programs

_____ b. to identify individuals/organizations working in a specific scientific area(s) of interest

_____ c. to demonstrate that a R&D project is unique

_____ d. to search for new technology

_____ e. to evaluate the state of the art in a S&T area of interest

_____ f. to check to see if any references have been missed in doing background research

_____ g. other (specify below)

_____

_____

_____

_____

_____

28. How often does information obtained from DTIC appear to satisfy the enduser's requirements?

___ a. Always ___ b. Usually ___ c. Sometimes ___ d. Never

30. If the library receives positive feedback from customers about the value of DTIC information, what are the comments? (Please rank the frequency of the comments listed below. Enter "6" for most frequent, "5" for second most frequent, etc. Enter 0 for comments that are not applicable).

_____ a. information obtained saved time in R&D project efforts

_____ b. information obtained saved money

_____ c. information obtained prevented duplication of other DoD or contractor R&D efforts

_____ d. availability of DTIC data bases precluded need to expend extensive time searching for information from other information resources

_____ e. information obtained was not available elsewhere

_____ f. information obtained provided alternative designs and/or methodologies not previously considered

_____ g. other (specify below)

_____

_____

_____

_____

_____

31. If the library receives negative feedback from customers about the value of DTIC information or information processing, what are the complaints? (Please rank the frequency of the comments listed below. Enter "6" for most frequent, "5" for second most frequent, etc. Enter 0 for comments that are not applicable).

_____ a. too many bibliographic references and/or documents were provided

_____ b. too few bibliographic references and/or documents were provided

_____ c. document was not received quickly enough

_____ d. information received was not pertinent to search topic

_____ e. information content was not current enough

_____ f. other (specify below)

_____

_____

_____

_____

32. Please provide any comments you may have about DTIC information services and procedures for their use:

_____

_____

_____

_____

_____

_____

APPENDIX E

SURVEY MATERIALS FOR BENCH-LEVEL SCIENTISTS AND ENGINEERS AT THE R&D LABORATORIES

E.1. This appendix contains two annexes:

- Annex 1, Phase I Survey Questionnaire Package
- Annex 2, Phase II Survey Questionnaire Package.

E.2. The Phase I survey package included one of the two explanatory cover letters (one version was sent to laboratories with technical libraries, and the other version was sent to laboratories without technical libraries), the R&D center and laboratory distribution list, instructions for completing the questionnaire, and the questionnaire itself. The Phase I survey materials were sent to designated points of contact at the various laboratories and included, where appropriate, a package of materials to be forwarded to the technical library (see Appendix D).

E.3. The Phase II survey package included an explanatory cover letter, a R&D center and laboratory distribution list, lists for distribution of questionnaires to individual scientists and engineers at each laboratory, instructions for completing the questionnaire, and the questionnaire itself.

ANNEX 1
PHASE I SURVEY QUESTIONNAIRE PACKAGE

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA. 22333

AMCLD

25 March 1985

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

SEE DISTRIBUTION

1. The Army is continually concerned that R&D scientists and engineers receive the most effective scientific and technical (S&T) information support possible. Headquarters, AMC, has responsibility to "coordinate administration and execution of the STIP" (Scientific and Technical Information Program Ref AR 70-45, Section II, 11). AMC is concerned with assuring effective technical communication in their "coordination" role and has recently initiated a review of the use of the Defense Technical Information Center (DTIC) resources by Army R&D scientists and engineers. Our goal is to recognize and enhance the effectiveness of Army use of DTIC information resources and services. The specific objectives of the review are the following:

a. To obtain hard data about the extent to which "bench-level" R&D people use DTIC information and services,

b. To identify the benefits to Army R&D accruing from the availability of DTIC resources,

c. To elicit suggestions for improvement of Army usage of DTIC information resources.

2. To obtain needed data, Headquarters, AMC is inquiring about the use of DTIC resources by the technical libraries and scientists and engineers in the Army R&D centers and laboratories. The inquiry will be conducted in two phases. During the first phase, the libraries will be asked to provide data on library resources and procedures for processing DTIC information, and each laboratory's population of bench-level scientists and engineers will be questioned to collect data on the extent of DTIC usage. After the results of Phase I have been received and processed, a sample of DTIC users will be selected for Phase II of the survey. This second sample group will then be asked to provide specific information about the benefits of DTIC resources to their work. Since your

AMCLD
SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

information center or library acts as an intermediary between your R&D personnel and DTIC, we would like the chief of that branch or section to eventually assist us with the conduct of Phase II of the inquiry.

3. Materials for Phase 1 of the inquiry (which have been tested by selected scientists and technical information specialists) are enclosed and include the following items:

a. Questionnaires to be distributed to bench-level R&D scientists and engineers and first line supervisors in your organization

b. A letter addressed to the chief of your technical library explaining the inquiry and requesting assistance with the conduct of the second phase of the inquiry.

c. A questionnaire to be filled out by your technical information center or equivalent office.

4. Please distribute the enclosed questionnaires within your organization, and forward the package of materials for the library to the individual whose name and address appear on the package. The firm of Presearch Incorporated has been contracted to perform services (such as data processing) in conjunction with this inquiry. The completed questionnaires are to be returned to Presearch Incorporated, ATTN: DTIC Study, 8500 Executive Park Avenue, Fairfax, Virginia 22031 no later than 26 April 1985.

5. We wish to emphasize that these data will not be used to evaluate the S&T information centers and libraries or individual R&D personnel. The data are needed to estimate the extent of Army use of DTIC resources.

6. POC for coordination and sponsorship of this effort is Jack Kolb, AUTOVON 284-8671.

Jack Kolb

3 Encl
as

JACK KOLB
Principal Army Technical
Information Officer

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA. 22333

AMCLD 25 March 1985

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

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AMCLD

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

3. Questionnaires for Phase 1 of the inquiry (which have been tested by selected scientists) are enclosed. Please distribute the questionnaires to bench-level R&D scientists and engineers and first line supervisors in your organization. The firm of Presearch Incorporated has been contracted to perform services (such as data processing) in conjunction with this inquiry. The completed questionnaires are to be returned to Presearch Incorporated, ATTN: DTIC Study, 8500 Executive Park Avenue, Fairfax, Virginia 22031 no later than 26 April 1985.

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5. POC for coordination and sponsorship of this effort is Jack Kolb, AUTOVON 284-8671.

Jack Kolb

1 Enclosure
ajs

JACK KOLB
Principal Army Technical
Information Officer

AMCLD

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

Dir, US Army Materials and Mechanics Research Center, ATTN: AMXMR-PP, Watertown, MA 02172

Dir, US Army Research Office, ATTN: AMXRO-TS/LTC Rodney I. McCormick, PO Box 12211, Research Triangle Park, NC 27709-2211

Dir, US Army Human Engineering Laboratory, ATTN: DRXHE-D/Dr. Mark Hofmann, Aberdeen Proving Ground, MD 21005-5001

Cdr, US Army Armament Research and Development Center, ATTN: SMCAR-RAM/ Mr. Jim Greenfield, Dover, NJ 07801-5000

Dir, US Army Ballistic Research Laboratory, ATTN: AMXBR-ODC/Mr. Arthur Coates, Aberdeen Proving Ground, MD 21005

Cdr, Large Caliber Weapons Systems Laboratory, ATTN: SMCAR-LCP-SL/Mr. Vic Siele, Dover, NJ 07801-5001

Dir, US Army Research and Technology Laboratories, ATTN: SAVDL-AS/ LTC Thomas Almojuela, Ames Research Center, Moffett Field, CA 94035

Dir, Aeromechanics Laboratory, ATTN: SAVDL-AL-F/Mr. Andy Morse, Ames Research Center, Moffett Field, CA 94305

Dir, Applied Technology Laboratory, ATTN: SAVDL-ATL-DD/ Ft. Eustis, VA 23604

Dir, Night Vision and Electro Optics Laboratory, ATTN: DELNV-TM Mrs. Marguerite McFarland, Ft. Belvoir, VA 22060-5677

Dir, Harry Diamond Laboratories, ATTN: DELHD-TA/John Carrier, 2800 Powder Mill Road, Adelphi, MD 20783

Cdr, US Army Electronics Research and Development Command, ATTN: AMDEL-CT-R/Mr. John Johnson, 2800 Powder Mill Road, Adelphi, MD 20783

Cdr, US Army Communications & Electronics Command, ATTN: AMSEL-POD-P-L/ Mr. Martin Schroeder, Ft. Monmouth, NJ 07703-9990

Cdr/Dir, Atmospheric Sciences Laboratory, ATTN: DELAS-DP-P/Mr. John Marrs, White Sands Missile Range, NM 88002

Cdr, Combat Surveillance and Target Acquisition Laboratory, ATTN: DELCS-D/ Mr. William Fishbein, Ft. Monmouth, NJ 07703

Cdr, US Army Belvoir R&D Center, ATTN: STRBE-HA/Mr. Jerry Dean, Ft. Belvoir, VA 22060-5606

Cdr, US Army Natick R&D Center, ATTN: STRNC-A, Natick, MA 01760-5000

Cdr, US Army Missile Command, ATTN: AMSMI-RN/Mr. Howard C. Race, Redstone Arsenal, AL 35898-5243

Cdr, US Army Tank-Automotive Command, ATTN: AMSTA-NK/ Warren, MI 48090

Cdr, US Army Research Institute for the Behaviorial and Social Sciences, ATTN: PERI-PO/Mr. Tom Kelly, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

Cdr, US Army Cold Regions Research and Engineering Laboratory, ATTN: CRREL-PP/ 72 Lyme Road, Hanover, NH 03755-1290

AMCLD

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

Cdr, US Army Medical Research and Development Command, ATTN: SGRD-RMS/Mr. Larry Ware, Ft. Detrick, Frederick, MD 21701

Cdr, US Army Medical Bioengineering Research and Development Lab, ATTN: SGRD-UBZ-X/COL Ralph Carestia, Ft. Detrick, Frederick, MD 21701-0510

Cdr, US Army Medical Research Institute of Chemical Defense, ATTN: SGRD-UV-AO, Bldg E3100, Aberdeen Proving Ground, MD 21010-5425

Cdr, US Army Medical Research Institute of Infectious Diseases, ATTN: SGRD-UIZ-D, Bldg 1425, Ft. Detrick, Frederick, MD 21701-5011

Cdr, US Army Aeromedical Research Lab, ATTN: SGRD-UAX-SI/Ms. Sybil H. Bullock, Ft. Rucker, AL 36362-5000

Dir, Walter Reed Army Institute of Research, ATTN: SGRD-UWZ-I/Mr. Peyton Williams, Washington, DC 20307-5100

Cdr, Letterman Army Institute of Research, ATTN: SGRD-ULZ-A, Presidio of San Francisco, CA 94129-6800

Cdr, Fire Control and Small Caliber Weapon Systems Laboratory, ATTN: SMCAR-SC/Mr. Dale Adams, Dover, NJ 07801

Cdr, Chemical Research and Development Center, ATTN: SMCCR-TD/Dr. Billy Richardson, Aberdeen Proving Ground, MD 21010

Cdr, US Army Aviation Engineering Flight Activity, ATTN: SAVTE-CT/Mr. James Hayden, Edwards Air Force Base, CA 93523

Dir, Electronics Technology & Devices Laboratory, ATTN: DELET-D/Dr. C.G. Thornton, Ft. Monmouth, NJ 07703

Dir, Electronics Warfare Laboratory, ATTN: DELEW-D/Mr. Robert Giordano, Ft. Monmonth, NJ 07703

AMCLD

REVIEW OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) RESOURCES BY SCIENTISTS AND ENGINEERS IN THE ARMY R&D CENTERS AND LABORATORIES

25 March 1985

INTRODUCTION/INSTRUCTIONS

INTRODUCTION

This review addresses the use of Defense Technical Information Center (DTIC) resources by scientists and engineers in the Army R&D centers and laboratories. The review is being sponsored by Headquarters, AMC to obtain hard data on the extent of DTIC usage by the R&D community and to identify the benefits of DTIC support to Army R&D

As a scientific and technical (S&T) information user, you are being asked to complete this questionnaire to assist Headquarters, AMC to acquire information about usage of DTIC resources by R&D personnel. Your cooperation in completing this questionnaire is essential if Headquarters, AMC is to obtain information needed to enhance the effectiveness of Army use of DTIC resources.

INSTRUCTIONS

Please read these instructions and the questions carefully before completing the questionnaire.

The questionnaire is divided into two parts. Part I requests identifying information about the respondent. Part II requests substantive information and contains four multiple-choice questions.

Please return the questionnaire to the individual at your facility who is responsible for distributing and collecting the questionnaires. (Completed questionnaires must arrive at Presearch Incorporated, 8500 Executive Park Avenue, Attn: DTIC Study, Fairfax, VA 22031 no later than 26 April 1985.) After your completed questionnaire is processed, you may be contacted for additional information.

(see reverse)

RESPONDENT ID: № 20918

QUESTIONNAIRE

Part I. Questionnaire Identification

Please provide the following information. Then go on to complete Part II.

Name of Respondent: _____

Respondent's Office Symbol: _____

Respondent's Telephone Numbers:

Commercial _____ Autovon _____

Date questionnaire completed: _____

Part II. Questions and Answers

1. Do you use Defense Technical Information Center (DTIC) information or services, as provided to you by your technical library and/or by DTIC directly?

   _____ a. Yes _____ b. No

NOTE: If you answered "Yes," skip question 2 and to on to questions 3 & 4. If you answered "No," answer only question 2.

2. If you do not use DTIC information or services, why not? (Check only one)

   _____ a. Not aware of DTIC information and services

   _____ b. Not convenient to use

   _____ c. Does not contain information in my subject-area(s) of interest

   _____ d. Other

3. In comparison with other sources of technical information, how valuable do you consider the availability of DTIC information resources to your work, on a scale from 0 to 5? (0 = not valuable and 5 = extremely valuable) (Circle one)

   0 1 2 3 4 5

4. What is the most important benefit provided by the availability of DTIC information and services? (Check only one)

   _____ a. Provides information not available elsewhere

   _____ b. Eliminates need to conduct time-consuming manual searches for information from other informatioon resources

   _____ c. DTIC information saves time in R&D project efforts

   _____ d. Information from DTIC saves money

   _____ e. Information from DTIC prevents duplication of other DOD or contractor R&D efforts

   _____ f. Information from DTIC provides alternative designs and or methodologies not previously considered

   _____ g. other

ANNEX 2
PHASE II SURVEY QUESTIONNAIRE PACKAGE

DEPARTMENT OF THE ARMY
HEADQUARTERS, U. S. ARMY MATERIEL COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333-0001

1 July 1985

AMCLD

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories, Phase II

SEE DISTRIBUTION

1. As you know, in March we conducted the first phase of the Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories. During Phase I, we questioned libraries on their resources and procedures for processing DTIC information, and we surveyed each laboratory's population of bench-level scientists and engineers to collect data on the extent of DTIC usage. To follow up on the results of Phase I of the survey, we have selected for further survey, a group of those scientists and engineers who (based on their responses to the short end-user questionnaire) use and place a high value on DTIC resources. We would like to ask these individuals to provide specific information about the benefits of DTIC resources to their work.

2. Questionnaires for this second phase of the inquiry (which have been tested by selected scientists and engineers) are enclosed.

3. Please distribute the questionnaires within your organization to the individuals whose names appear on the enclosed distribution list. The firm of Presearch Incorporated has been contracted to perform services (such as data processing) in conjunction with this inquiry. The completed questionnaires are to be returned to Presearch Incorporated, ATTN: DTIC Study, 8500 Executive Park Avenue, Fairfax, Virginia 22031, no later than 26 July 1985.

4. We wish to emphasize that these data will not be used to evaluate individual laboratories or R&D personnel. The data are needed to identify the benefits of DTIC resources to Army R&D.

5. POC for coordination and sponsorship of this effort is Jack Kolb, AUTOVON 284-8671. Any questions concerning distribution and collection of the questionnaires may be directed to Kathleen Zaccardo of Presearch Incorporated, (703) 876-6574.

Jack Kolb

Jack Kolb
Principal Army Technical
Information Officer

Enclosures

AMCLD

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

Dir, US Army Materials and Mechanics Research Center, ATTN: AMXMR-PP, Watertown, MA 02172

Dir, US Army Research Office, ATTN: AMXRO-TS/LTC Rodney I. McCormick, PO Box 12211, Research Triangle Park, NC 27709-2211

Dir, US Army Human Engineering Laboratory, ATTN: DRXHE-D/Dr. Mark Hofmann, Aberdeen Proving Ground, MD 21005-5001

Cdr, US Army Armament Research and Development Center, ATTN: SMCAR-RAM/ Mr. Jim Greenfield, Dover, NJ 07801-5000

Dir, US Army Ballistic Research Laboratory, ATTN: AMXBR-ODC/Mr. Arthur Coates, Aberdeen Proving Ground, MD 21005

Dir, US Army Aviation Research and Technology Laboratories, ATTN: SAVDL-AS/ LTC Thomas Almojuela, Ames Research Center, Moffett Field, CA 94035

Dir, Applied Technology Laboratory, ATTN: SAVDL-ATL-DD/Ft. Eustis, VA 23604

Dir, Night Vision and Electro Optics Laboratory, ATTN: DELNV-TM Mrs. Marguerite McFarland, Ft. Belvoir, VA 22060-5677

Dir, Harry Diamond Laboratories, ATTN: DELHD-TA/John Carrier, 2800 Powder Mill Road, Adelphi, MD

Cdr, US Army Communications & Electronics Command, ATTN: AMSEL-POD-P-L/ Mr. Martin Schroeder, Ft. Monmouth, NJ 07703-9990

Cdr/Dir, Atmospheric Sciences Laboratory, ATTN: DELAS-DP-P/Mr. John Marrs, White Sands Missile Range, NM 88002

Cdr, Combat Surveillance and Target Acquisition Laboratory, ATTN: DELCS-D/ Mr. William Fishbein, Ft. Monmouth, NJ 07703

Cdr, US Army Belvoir R&D Center, ATTN: STRBE-HA/Mr. Jerry Dean, Ft. Belvoir, VA 22060-5606

Cdr, US Army Natick R&D Center, ATTN: STRNC-A, Natick, MA 01760-5000

Cdr, US Army Missile Command, ATTN: AMSMI-RM/Mr. Howard C. Race, Redstone Arsenal, AL 35898-5243

Cdr, US Army Tank-Automotive Command, ATTN: AMSTA-NK/Warren, MI 48090

Cdr, US Army Cold Regions Research and Engineering Laboratory, ATTN: CRREL-PP/ 72 Lyme Road, Hanover, NH 03755-1290

Cdr, US Army Medical Bioengineering Research and Development Lab, ATTN: SGRD-UBZ-X/COL Ralph Carestia, Ft. Detrick, Frederick, MD 21701-0510

Cdr, US Army Medical Research Institute of Chemical Defense, ATTN: SGRD-UV-AO, Bldg E3100, Aberdeen Proving Ground, MD 21010-5425

Cdr, US Army Aeromedical Research Lab, ATTN: SGRD-UAX-SI/Ms. Sybil H. Bullock, Ft. Rucker, AL 36362-5000

Cdr, Letterman Army Institute of Research, ATTN: SGRD-ULZ-A, Presidio of San Francisco, CA 94129-6800

Cdr, Chemical Research and Development Center, ATTN: SMCCR-TD/Dr. Billy Richardson, Aberdeen Proving Ground, MD 21010

Dir, Electronics Technology & Devices Laboratory, ATTN: DELET-D/ Dr. C.G. Thornton, Ft. Monmouth, NJ 07703

Dir, Electronics Warfare Laboratory, ATTN: DELEW-D/Mr. Robert Giordano, Ft. Monmouth, NJ 07703

AMCLD

SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

DISTRIBUTION:

Dressel, Francis G./AMXRO-MA
Mayer, George/AMXRO
Schwering, F./AMXRO-EL

Bechtol, T. Robert/AMXBR-SECAD
Burns, Bruce P./AMXBR-IBD
Coates, Randolph S./AMXBR-TBD
Copland, Allister/AMXBR-TBD
Goodman, Henry J./AMXBR-VLD-R
Guidos, Bernard J./AMXBR-LFD
Haskell, Donald F./AMXBR-VLD-A
Hess, Kenneth J./AMXBR-VLD
Hillstrom, Warren/AMXBR-TBD
Kineke, John J./AMXBR-TBD
Korba, Adam/AMXBR-VLD-L
Kruse, Loren R./AMXBR-VLD-L
Lottero, Richard E./AMXBR-TBD
Maloney, Joseph J./AMXBR-VLD
Nusca, Michael J./AMXBR-LFD
Petty, Donald W./AMXBR-IBD
Schmidt, E. M./AMXBR-LFD
Schroeder, Michael A./AMXBR-IBD
Schumacher, Robert N./AMXBR-VLD
Temperley, Judith K./AMXBR-SECAD
Thompson, Lee A./AMXBR-VLD-A
Walters, William P./AMXBR-TBD
Weaver, Glenn/AMXBR-TBD
Wilsey, Edward F./AMXBR-VLD-R
Zardas, Stephen J./AMXBR-VLD-L

Granville, Dana M./AMXMR-OC
Haskell, William E./AMXMR-OC
Jaklitsch, Donald/AMXMR-OC
Messier, Donald R./AMXMR-MC
Murray, Thomas/AMXMR-OC
Perkins, Larry P./AMXMR-MPM
Sagalyn, Paul L./AMXMR-OM
Tessier, Noel/AMXMR-OC
Willingham, Reginald A./AMXMR-OP
Yip, Pearl/AMXMR-CDD

Armstrong, R./AMXHE-FR
Cox, Marcus A./AMXHE
Eversole, Paige/AMXHE-ST
Fatkin, Linda/AMXHE-BR
Golden, Michael G./AMXHE-FT
McJilton, Walter N./AMXHE-CC

Jellinek, John/AMSTA-RCKT
Kling, Briant J./AMSTA-RGRD
Ogilvy, James W./AMSTA-RCKM
Phelps, Donald E./AMSTA-ZSK
Schevo, Botvid A./AMSTA/RCKM
Sheldon, Dan/AMSTA-RGRD
Woody, Marquis W./AMSTA-RGVG

Applegate, Russell, J./AMSMI-RDR
Bentley, James H./AMSMI-RHS
Burt, James/AMSMI-RDK
Byrd, Joe L./AMSMI-RGC
Cole, John/AMSMI-RDR
Curtis, Richard A./AMSMI-REO
Dickson, Richard E./AMSMI-RDD
Greer, Charles/AMSMI-RKL
Herren, Kenneth/AMSMI-RRO
Hitchcock, Gary/AMSMI-RDR
Holloman, Miles/AMSMI-RHS
Honeycutt, Thomas E./AMSMI-RHS
Lilley, Jay S./AMSMI-RKA
MacCrone, George G./AMSMI-RHS
Meagher, William/AMSMI-RDK
Passwater, Rufus D./AMSMI-ROC
Patterson, Stanely P./AMSMI-RHS
Peterson, Donald R./AMSMI-RVA
Sanders, George/AMSMI-RDK
Stanely, Ann E./AMSMI-RRD
Stewart, Dorathy A./AMSMI-RRA
Terry, John E./AMSMI-RN
Ward, Robert C./AMSMI-RDD
Washington, Dave/AMSMI-RDK
Wright, James W./AMSMI-RKP

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SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

DISTRIBUTION:

Abrahamian, Ara/DELHD-IT-RT
Arsem, Collins/DELHD-RT-AD
Borisky, Michael/DELHD-SA
Crickman, Charles/DELHD-DE-FT
Drake, Andre S./DELHD-DE-FM
Eicke, John/DELHD-DE-FT
Everett, Joseph/DELHD-RT-AB
Gaylord, Philip G./DELHD-RT-RD
Gher, Thomas J./DELHD-IT-ED
Gluckman, Albert/DELHD-
Gornak, George/DELHD-NW-EB
Hislop, David W./AMDEL-PO-PI
Kulpa, Stanley M./DELHD-PO-P
Lieberman, Stu/DELHD-RT-AA
Maupin, Robert T./DELHD-LM-E
Mills, T.K./DELHD-IT-EB
Scott, Walter J./DELHD-NW-EE
Sola, Marcos C./AMXCM-EO
Triminer, Paul/DELHD-NW-RA
Welch, Eric L./AMDEL-PO-PI
Wyatt, William T./DELHD-NW-EC

Ahadi, Shahpour/DELNV-V
Brooks, R./DELNV-SI
Goodwin, Daniel L./DELNV-ACD
Illg, Gary/DELNV-L
Kelso, Ed/DELNV-IRTD
Kitrosser, Joseph H./DELNV-AC
Leslie, John A./DELNV-V
Lin, Isan/DELNV-AC
Miller, Brian/DELNV-IRTD
Nash, Carolyn/DELNV-V
Norton, Mark/DELNV-L
Patrick, E. Vincent/DELNV-V
Sharp, Edward J./DELNV-R
Shields, Frank J./DELNV-V
Wilson, Herb/DELNV-IRTD

Gevizakes, Vasilios A./DELEW-C
Konig, Charles/DELEW-C
Szantai, Frank M./DELEW-SI-G

Burke, Morton H./DELET-PE
Clarke, John/DELET-ES
Finnegan, Robert D./DELET-ES
Fischer, Paul/DELET-MW-B
Fitzgerald, Robert/DELET-IB-H
Heath, Linda/DELET-EA
Leupold, Herbert A./DELET-ES
Lukaszek, Ted/DELET-MA
Poli, Louis/DELET-MH-W
Smith, Bernard/DELET-MW-S
Tauber, Arthur/DELET-ES
Wilber, William/DELET-ES
Wurthmann, Gunther E./DELET-MW

Brown, Peter/DELCS-K
Chen, Charles H./DELCS-C-T
Johnson, Ockle/DELCS-K
Mallas, Dorothy/DELCS-I
Miller, Robert J./DELCS-I
Silverstein, Jacob/DELCS-S

Copp, Doug/DELAS-AE-A
Easton, Patrick J./DELAS-AT-M
Hansen, Frank V./DELAS-AE-A
Johnson, Odell M./DELAS-AT-F
Kays, Marvin D./DELAS-AE-O

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Albert, Stuart D./AMSEL-COM-RY
Campell, Don V./AMSEL-COM-RN
Chen, Nickie/AMSEL-SEI-I
Drummond, Robert R./AMCPM-TMDE-LT
Goubeaud, George J./AMCPM-SC-5
Kvrian, Frank W./AMCPM-TMDE-LT
Rooney, Charles J./AMCPM-TMDE-LS
Segner, Samuel M./AMSEL-SEI-A

Campbell, Robert L./SAVDL-ATL-ASR
Conway, Wallace R./SAVDL-ATL-SAS
Gallow, Gordon T./SAVDL-ATL-ASI
Hunthausen, Roger/SAVDL-ATL-ASR
McAllister, George T./SAVDL-ATL-ASV
Orlino, Drew G./SAVDL-ATL-ASV
Pociluyko, Stephen/SAVDL-ATL-ASV
Scruggs, Bill W./SAVDL-ATL-ASV
Tansey, John F./SAVDL-ATL-ASI
Woodhouse, Jin-Young K./SAVDL-ATL-ASV

Bivens, Courtland C./SAVDL-AL-C
Richard, Dunn/SAVDL-AS

Michie, Mark W./SGRVD-UV-CP
Polhamus, G.D./SGRVD-UV-YN
Ray, Radharaman/SGRVD-UV-PB
Shih, M./SGRVD-UV-VA
Sultan, Walter E./SGRVD-UV-DD

Black, Kenneth/SGRD-UL
Gupta, Raj K./SGRD-ULU-T
Harmon, Julius C./SGRD-UL
Hiatt, Gerald/SGRD-ULV-T
Hollenbach, Stanley J./SGRD-UL
Levine, Richard/SGRD-UL-OH
Sano, Steven Kazvo/SGRD-ULV-T
Stuck, Bruce/SGRD-UL-OH

Boobar, Lewis R./SGRD-UBE-VC
Burrows, W. D./SGRD-UBG-L
Finch, Robert A./SGRD-UBG-M
Kelly, John A./SGRD-UBG

Siering, George D./SGRD-UAB
Wehrly, David/SGRD-UAB-CB

Baker, Mark S./STRBE-EEE
Barnard, Robert L./STRBE-XIL
Chapin, Charles C./STRBE-VF
DeLorenzo, William A./STRBE-NEZ
Ebner, David/STRBE-XDC
Gerrity, Ellen A./STRBE-XDR
Howden, Ken/STRBE-XDR
Lucas, James P./STRBE-E
Rodriguez, Gueme/STRBE-VU
Schaekel, Forrest H./STRBE-VFF
Shaefer, Henry W./STRBE-NCP
Sgroi, Thomas J./STRBE-EME
Silver, Ivan M./STRBE-TE
Stefanaye, D./STRBE-NN

Respondent I.D. Numbers:

12553/STRNC-UE
12560/STRNC-UE
12565/STRNC-UAS
12579/STRNC-UAD
12582/STRNC-UAP
12594/STRNC-USO
12608/STRNC-UXE
12737/STRNC-ITC
12744/STRNC-ICH
12745/STRNC-ICA
12790/STRNC-YB
12810/STRNC-YEP
12811/STRNC-YEP
12830/STRNC-YSC
12834/STRNC-YSA
12877/STRNC-OI
12883/STRNC-OA
12884/STRNC-OA

Legget, Daniel C./CRREL-RE
Marshall, Stephen J./CRREL-RG
Parker, Louise/CRREL-EA

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SUBJECT: Inquiry of the Use of Defense Technical Information Center (DTIC) Resources by Army R&D Centers and Laboratories

Large Caliber Weapons Laboratory
Carofano, Garry C./SMCAR-LCB-RA
Sollot, G.P./SMCAR-LCE-C

Fire Control and Small Caliber Weapons Laboratory
Blumer, Jost R./SMCAR-SCS-E
Cytron, S./SMCAR-SCM-P
Grew, W. Gilbert/SMCAR-SCS-Y
Keown, William P./SMCAR-SCM
Rorabaugh, Donald T./SMCAR-SCM-P
Wilkins, Clifford/FSL-SCS-E
Zandberg, Henry/SMCAR-SCS-E

Allan, Craig R./SMCCR-RSP-P
Arbogast, Walter, W./SMCCR-MUC
Au, George W./SMCCR-CBD
Baldwin, William/SMCCR-CBD
Barna, M./AMSMC-QAC-A
Belbot, Edward F./SMCCR-MSE
Belden, Robert F./SMCCR-MUC
Birmingham, Joseph G./SMCCR-RSC
Block, Frank/SMCCR-RSC-C
Cannon, Paul L./SMCCR-RSC-C
DeFrank, Joe/SMCCR-RSB
Eckhaus, Robert/SMCCR-CBD
Evans, Kenneth/SMCCR-MUS-A
Gilman, Jerry/SMCCR-RSC-A
Hasgell, Cecil/SMCCR-MUC
Laye, Randloph G./SMCCR-PPI
Lopez, Juan D./SMCCR-RSP-P
Muse, Bill/SMCCR-RST-E
Penski, Elwin, C./SMCCR-RSC-P
Sarver, Emory W./SMCCR-RSL
Sickenberger, David/SMCCR-CBB
Stevens, John I./SMCCR-RSC-C
Thomas, Terry E./SMCCR-MUC
White, William E./SMCCR-RSB
Wood, Richard/SMCCR-RSC-C

AMCLD

REVIEW OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) RESOURCES BY SCIENTISTS AND ENGINEERS IN THE ARMY R&D CENTERS AND LABORATORIES

1 July 1985

INTRODUCTION/INSTRUCTIONS

INTRODUCTION

This review addresses the use of Defense Technical Information Center (DTIC) resources by scientists and engineers in the Army R&D centers and laboratories. This review is the second part of a larger review of the use of DTIC resources by Army scientists and engineers being conducted by Headquarters, AMC. The objective is to obtain hard data on the extent of DTIC usage by the R&D community and to identify the benefits of DTIC support to Army R&D.

We are reviewing selected scientists and engineers to obtain information about their Scientific and Technical (S&T) *information needs, their reasons for requesting* S&T information, the purposes for which they use this information, and their perceptions about the value of DTIC information to Army R&D.

Based on your responses to an earlier, short questionnaire, you have been identified as a DTIC information user. You are being asked to complete this questionnaire to assist Headquarters, AMC to acquire information about usage of DTIC resources by R&D personnel. Your cooperation in completing this questionnaire is essential if Headquarters, AMC is to obtain information needed to enhance the effectiveness of Army use of DTIC resources.

INSTRUCTIONS

Please read these instructions carefully and review the questionnaire before beginning to answer the questions.

The questionnaire is divided into two parts. Part I requests identifying information about the respondent. Part II requests substantive information and contains a total of 20 questions which are logically organized into three groups identified by subheadings. Most of the questions are multiple choice to reduce the time required to answer them and to facilitate automated processing. Space is provided for comments that respondents may wish to add.

Some of the questions request data of a statistical nature. Although you may not have statistics available, please provide your best estimates of the values requested.

Please return Parts I & II of the questionnaire to Presearch Incorporated, Attn: DTIC Study, 8500 Executive Park Avenue, Fairfax, VA 22031 so that it arrives no later than 26 July 1985. After we receive your completed questionnaire, you may be contacted by telephone to follow up on questionnaire responses.

RESPONDENT ID _____

REVIEW OF THE USE OF DEFENSE TECHNICAL INFORMATION CENTER (DTIC) RESOURCES BY SCIENTISTS AND ENGINEERS IN THE ARMY R&D CENTERS AND LABORATORIES

1 July 1985

QUESTIONNAIRE

Part I. Questionnaire Identification

Please enter your name, title, address, telephone numbers, and the date you completed the questionnaire. Then go on to complete Part II.

Name of Respondent: _____

Title of Respondent: _____

Respondent's Address and Office Symbol: _____

_____

_____

Respondent's Telephone Numbers:
Commercial _____ Autovon _____

Date questionnaire completed: _____

Part II. QUESTIONS ANSWERS

A. Background Information on Respondent

1. Does your work primarily involve (Choose one) 1._____

   a. Basic Research
   b. Applied Technology
   c. Applied Research

2. What is your primary role within your organization? (Choose one) 2._____

   a. Conduct "Bench Level" R&D
   b. Supervise other scientists and engineers doing "bench level" R&D

3. What are your primary fields or disciplines? (Choose up to 3 of the categories listed below) 3._____ _____ _____

   a. Aeronautics
   b. Agriculture
   c. Astronomy & Astrophysics
   d. Atmospheric Sciences
   e. Behaviorial & Social Sciences
   f. Biological & Medical Sciences
   g. Chemistry
   h. Earth Sciences & Oceanography
   i. Electronics & Electrical Engineering
   j. Energy Conversion
   k. Materials
   l. Mathematical Sciences
   m. Mechanical, Industrial, Civil & Marine Engineering
   n. Methods & Equipment
   o. Military Sciences
   p. Missile Technology
   q. Navigation Communications, Detection & Countermeasures
   r. Nuclear Sciences & Technology
   s. Ordnance
   t. Physics
   u. Propulsion & Fuels
   v. Space Technology

4. Do you use any government or commercial current awareness services that announce the availability of new technical documents in your subject-area of interest? 4._____

a. Yes b. No

NOTE: If you checked 4a above, go on to question 5. If you checked 4b, skip question 5 and go on to question 6.

5. Which current awareness services do you use on a regular basis? 5._____

a. DTIC Current Awareness Bibliography (CAB)
b. Other (specify below)

_____

_____

_____

_____

6. What percentage of the total S&T information you obtain about new R&D efforts in your field come from the following sources? (If not applicable, put 0 in blank. Estimates must total 100%)

a._____
b._____
c._____
d._____
e._____
Total = 100%

a. scientific and technical journals
b. professional associations and conferences
c. contacts with other scientists and engineers
d. automated information systems
e. other (specify below)

_____

_____

_____

B. Respondent's Usage of DTIC Resources

7. What percentage of the total S&T information you use in your work is obtained from DTIC data bases or through usage of DTIC information services? 7. _____%

8. During the past year, about how many times has a library response to a request for information included information obtained from DTIC? 8. _____

9. How often have you specifically requested your technical library to obtain information for you from the DTIC data bases during the past year? 9. _____

10. What are your most frequent reasons for requesting information from DTIC data bases? (Choose up to 4 reasons) 10. _____ _____ _____ _____

a. to conduct background research for Inhouse Laboratory Independent Research (ILIR) programs

b. to identify individuals/organizations working in specific scientific area(s) of interest

c. to demonstrate that a R&D project is unique

d. to search for new technology

e. to evaluate the state of the art in a S&T area of interest

f. to check to see if any references have been missed in doing background research

g. other (specify below)

_____

_____

_____

11. Approximately how many times during the past year have you requested the following types of DTIC output? (If none, put 0 in the blank) 11 a. _____ b. _____ c. _____ d. _____

a. Bibliographies
b. Technical reports
c. Work unit summaries
d. Other (specify below)

_____

_____

12. On the average, how many hours per month, if any, do you spend reading the following DTIC products? (If none, put 0 in the blank) 12 a._____

b._____
c._____
d._____
e._____
f._____

a. Current Awareness Bibliography
b. Bibliographies (other than CAB)
c. Technical reports
d. Work unit summaries
e. Technical Abstract Bulletin (TAB)
f. Other (specify below)

_____

_____

_____

13. Are documents/reports that you have authored or coauthored in the DTIC Technical Report data base? 13._____

a. Yes b. No

C. Value of DTIC Resources

14. In comparison with other sources of technical information, how valuable do you consider the use of DTIC resources to your work on a scale from 0 to 5? (0 = not valuable and 5 = highly valuable) 14._____

15. How satisfied have you been with the information you have obtained from DTIC resources, on a scale from 0 to 5? (0 = not satisfied and 5 = highly satisfied) 15._____

16. How has information provided from DTIC resources been helpful to you, if at all? (Choose all applicable statements) 16. _____

a. Information obtained not available elsewhere _____

b. Information obtained saved time in R&D project efforts _____

c. Availability of DTIC data bases precluded need to expend extensive time searching for information from other information resources _____

d. Information obtained saved money _____

e. Information obtained prevented duplication of other DoD or contractor R&D efforts _____

f. Information obtained provided alternative designs and/or methodologies not previously considered _____

g. Other (specify below) _____

_____

_____

_____

_____

_____

_____

_____

17. If you were not satisfied with information or information processing provided by DTIC, why not? (Choose all applicable statements) 17. _____

a. Too many bibliographic references and/or documents were provided

b. Too few bibliographic references and/or documents were provided

c. Document was not received quickly enough

d. Information received was not pertinent to search topic

e. Information received was not current enough

f. Other (explain below)

_____

_____

_____

_____

18. a. If the information and services available from DTIC saved you time, estimate the amount of time in weeks saved during the past year. 18 a. _____ (weeks)

b. If DTIC information and services saved you money, please estimate the dollar value of the money saved during the past year:

_____

_____

_____

19. Please give an example of a specific case where DTIC information made a significant contribution to a project you worked on. Do not include cases that occurred more than three years ago. Please be as specific as possible. (You may attach an additional sheet of paper if you wish)

20. Please provide any comments you may have about DTIC information services:

APPENDIX F
INDIVIDUAL LIBRARY SURVEY DATA

F.1. This appendix contains survey data that have been tabulated to show values for the individual libraries responding to the survey. Tables F.1 through F.9 supplement information provided in the tables in Section V of this report.

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TABLE F.1

USE OF DTIC RESOURCES BY ARMY TECHNICAL LIBRARIES

Library	No. of Personnel on Library Staff	No. of Scientists & Engineers Supported	Level of Research of Scientists & Engineers Involved In:		No. and % of Library Staff Who Devote Significant Portion of Time to DTIC Tasks		Estimated % of All Information Requests That Require Use of DTIC	Estimated % and Number of Scientists and Engineers Who Use DTIC Resources	
			% Basic Research	% Applied Technology	No.	%		%	No.
Army Research Office	2	38	100	--	0	0	60	40	15
Ballistic Research Laboratory	16	600	18	82	5	31	100	75	450
Human Engineering Laboratory	3	109	15	85	1	33	55	80	88
Materials & Mechanics Research Center	7	340	15	85	3	43	50	No Response	
Applied Technology Laboratory	4	130	4	96	3	75	50	95	124
Armament R&D Center	18	2,500	15	85	6	33	80	65	1,625
Benet Weapons Laboratory	8	300	5	95	2	25	75	50	150
Chemical R&D Center	10	1,200	75	25	2	20	65	20	240
Harry Diamond Laboratories	6	350	50	50	2	33	50	80	280

TABLE F.1 (Cont)

Library	No. of Personnel on Library Staff	No. of Scientists & Engineers Supported	Level of Research of Scientists & Engineers Involved In: % Basic Research	% Applied Technology	No. and % of Library Staff Who Devote Significant Portion of Time to DTIC Tasks No.	%	Estimated % of All Information Requests That Require Use of DTIC	Estimated % and Number of Scientists and Engineers Who Use DTIC Resources %	No.
Redstone Scientific Information Center	28	2,908	No Response		8	29	60	75	2,181
Belvoir R&D Center	8	700	10	90	4	50	98	75	525
Natick R&D Center	9	136	80	20	2	22	25	92	125
Cold Regions Research and Engineering Laboratory	3	120	30	70	1	33	10	50	60
Research Institute for the Behavioral and Social Sciences	3	280	100	--	3	100	75	95	210
Medical R&D Command	8	300	No Response		2	25	25	No Response	
Medical Bioengineering R&D Laboratory	2	58	10	90	1	50	15	65	43
Medical Research Institute of Infectious Diseases	2	300	100	--	1	50	100	20	25

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TABLE F.1 (Cont)

Library	No. of Personnel on Library Staff	No. of Scientists & Engineers Supported	Level of Research of Scientists & Engineers Involved In: % Basic Research	% Applied Technology	No. and % of Library Staff Who Devote Significant Portion of Time to DTIC Tasks No.	%	Estimated % of All Information Requests That Require Use of DTIC	Estimated % and Number of Scientists and Engineers Who Use DTIC Resources %	No.
Aeromedical Research Laboratory	4	45	20	80	1	25	50	95	38
Letterman Army Institute of Research	3	100	65	31	2	67	25	25	50
Medical Research Institute of Chemical Defense	3	200	50	50	0	0	10	25	60
Walter Reed Army Institute of Research	8	550	No Response		3	38	60	No Response	
Total	155	11,264			52	34	53		6,289
Mean Response			42	58					

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TABLE F.2

LIBRARY RESOURCES FOR USING DROLS

Library	No. on Library Staff Who Operate DROLS Terminals	No. of DROLS Operators Trained by DTIC	No. of Years' Experience of Each DROLS Operator in Searching DTIC Data Bases 1/					
			Operator #1	Operator #2	Operator #3	Operator #4	Operator #5	Operator #6
Army Research Office	1	1	5	--	--	--	--	--
Ballistic Research Laboratory	5	5	7	5	2	2	1	--
Human Engineering Laboratory	2	2	2	1	--	--	--	--
Materials & Mechanics Research Center	2	3	11	4	2	--	--	--
Applied Technology Laboratory	2	2	12	3	--	--	--	--
Armament R&D Center	6	7	12	12	10	7	5	5
Benet Weapons Laboratory	2	1	5	2	--	--	--	--
Chemical R&D Center	6	3	10	4	3	2	2	2
Harry Diamond Laboratories	5	5	4	10	10	2	2	--
Redstone Scientific Information Center	9	5	14	14	6	5	3	3
Belvoir R&D Center	4	4	6	6	6	1	--	--
Natick R&D Center	2	2	12	12	--	--	--	--

PRESEARCH INCORPORATED

TABLE F.2 (Cont)

Library	No. on Library Staff Who Operate DROLS Terminals	No. of DROLS Operators Trained by DTIC	No. of Years' Experience of Each DROLS Operator in Searching DTIC Data Bases[1]					
			Operator #1	Operator #2	Operator #3	Operator #4	Operator #5	Operator #6
Cold Regions Research and Engineering Laboratory	--	--	--	--	--	--	--	--
Research Institute for the Behavioral and Social Sciences	3	3	7	5	1	--	--	--
Medical R&D Command	2	1	6	2	--	--	--	--
Medical Bioengineering R&D Laboratory	--	--	--	--	--	--	--	--
Medical Research Institute of Infectious Diseases	--	--	--	--	--	--	--	--
Aeromedical Research Laboratory	2	2	3	3	--	--	--	--
Letterman Army Institute of Research	2	2	1	1	--	--	--	--
Medical Research Institute of Chemical Defense	2	2	3	1	--	--	--	--
Walter Reed Army Institute of Research	--	--	--	--	--	--	--	--
Total	57	50						
Mean Response			7.1	5.3	5.0	3.2	2.6	3.3

[1] Space on the questionnaire was allotted for only six operators. The only library with more than six operators is the Redstone Scientific Information Center, which has a total of nine DROLS Operators.

TABLE F.3

LIBRARY USE OF DROLS FOR CATALOGING/INDEXING

Library	DROLS Used to Supplement Manual Cataloging 1/		Library Uses DROLS to Catalog/Index Technical Reports For SBIN		Participation in SBIN Improved Ability to Locate TRs in TR Data Base 2/	
	Yes	No	Yes	No	Yes	No
Army Research Office		X		X		
Ballistic Research Laboratory	X		X		X	
Human Engineering Laboratory		X		X		
Materials & Mechanics Research Center	X		X		X	
Applied Technology Laboratory	X			X		
Armament R&D Center	X		X		X	
Benet Weapons Laboratory	X			X		
Chemical R&D Center	X			X		
Harry Diamond Laboratories	X			X		
Redstone Scientific Information Center	X		X		X	
Belvoir R&D Center	X		X		X	
Natick R&D Center		X		X		
Cold Regions Research and Engineering Laboratory	--	--	--	--		

TABLE F.3 (Cont)

Library	DROLS Used to Supplement Manual Cataloging 1/		Library Uses DROLS to Catalog/Index Technical Reports For SBIN		Participation in SBIN Improved Ability to Locate TRs in TR Data Base 2/	
	Yes	No	Yes	No	Yes	No
Research Institute for the Behavioral and Social Sciences		X		X		
Medical R&D Command	X			X		
Medical Bioengineering R&D Laboratory	--	--	--	--		
Medical Research Institute of Infectious Diseases	--	--	--	--		
Aeromedical Research Laboratory		X		X		
Letterman Army Institute of Research		X		X		
Medical Research Institute of Chemical Defense		X		X		
Walter Reed Army Institute of Research	--	--	--	--		
Total	10	7	5	12	5	0
% of All responses	59	41	29	71	100	0

1/ Libraries without DROLS Terminals could not respond to questions concerning use of DROLS.

2/ Libraries who responded that they did not use SBIN could not respond to this question.

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TABLE F.4

LIBRARY EVALUATION OF DTIC TR INDEXING

Library	DTIC TR Indexing is Adequate for Library Purposes		Problems With Technical Report Indexing				
	Yes	No	Indexing Is Too General	DTIC Thesaurus Is Difficult To Use	Quality Of Indexing Is Inconsistent	No Problems Experienced	Other
Army Research Office	X					X	
Ballistic Research Laboratory	X			X			
Human Engineering Laboratory	X						X
Materials & Mechanics Research Center		X	X		X		
Applied Technology Laboratory	X			X	X		
Armament R&D Center	X		X				
Benet Weapons Laboratory		X	X				X
Chemical R&D Center	X		X		X		X
Harry Diamond Laboratories		X	X	X			
Redstone Scientific Information Center	X			X			
Belvoir R&D Center	X		X				

TABLE F.4 (Cont)

Library	DTIC TR Indexing is Adequate for Library Purposes		Problems With Technical Report Indexing				
	Yes	No	Indexing Is Too General	DTIC Thesaurus Is Difficult To Use	Quality Of Indexing Is Inconsistent	No Problems Experienced	Other
Natick R&D Center	X						X
Cold Regions Research and Engineering Laboratory	X					X	
Research Institute for the Behavioral and Social Sciences		X		X	X		
Medical R&D Command	X						X
Medical Bioengineering R&D Laboratory	X					X	
Medical Research Institute of Infectious Diseases	No Response		--	--	No Response	--	--
Aeromedical Research Laboratory	X		X		X		
Letterman Army Institute of Research		X	X		X		
Medical Research Institute of Chemical Defense		X	X		X		
Walter Reed Army Institute of Research	No Response		--	--	No Response	--	--
Total	13	6	9	5	7	3	5
% of All Responding Libraries		68	32	47	26	37	16

TABLE F.5

LIBRARY PROCEDURES FOR OBTAINING DTIC INFORMATION IN HARD COPY

Library	Library Has Significant Portion of TR Collection in Microform		Uses Microform Copies TR's to Print Out Paper Copies Locally		Methods Used By Libraries to Obtain Hard-Copy Bibliographies from DTIC Data Bases				Methods Used by Libraries to Obtain Hard-Copy Work Unit Summaries from DTIC Data Base			
	Yes	No	Yes	No	% Print Out Locally	% Ordered from DTIC On-Line	% Ordered from DTIC Off-Line	% Other	% Print Out Locally	% Ordered from DTIC On-Line	% Ordered from DTIC Off-Line	% Other
Army Research Office		X	--	--		100			50	50		
Ballistic Research Laboratory	X		X		5	90	5		1	98	1	
Human Engineering Laboratory		X	--	--		90	10				100	
Materials & Mechanics Research Center	X			X	5	94	1		5	90	5	
Applied Technology Laboratory	X			X	100				100			
Armament R&D Center	X		X		25	50	25		50	30		20
Benet Weapons Laboratory		X	--	--	10	90			5	95		
Chemical R&D Center	X		X		30	70			20	80		
Harry Diamond Laboratories	--	--	--	--	75	20		5	50	50		
Redstone Scientific Information Center	X		X		75	25			90	10		
Belvoir R&D Center		X	--	--	5	90	5		5	90	5	
Natick R&D Center	X			X	5	95			5	95		

TABLE F.5 (Cont)

Library	Library Has Significant Portion of TR Collection in Microform: Yes	Library Has Significant Portion of TR Collection in Microform: No	Uses Microform Copies TR's to Print Out Paper Copies Locally: Yes	Uses Microform Copies TR's to Print Out Paper Copies Locally: No	Methods Used By Libraries to Obtain Hard-Copy Bibliographies from DTIC Data Bases: % Print Out Locally	% Ordered from DTIC On-Line	% Ordered from DTIC Off-Line	% Other	Methods Used by Libraries to Obtain Hard-Copy Work Unit Summaries from DTIC Data Base: % Print Out Locally	% Ordered from DTIC On-Line	% Ordered from DTIC Off-Line	% Other
Cold Regions Research and Engineering Laboratory		X	--	--			100				100	
Research Institute for the Behavioral and Social Sciences	X			X	5	90	5		5	90	5	
Medical R&D Command	X		X		50	50			10	90		
Medical Bioengineering R&D Laboratory		X	X			100				100		
Medical Research Institute of Infectious Diseases		X	--	--			100				100	
Aeromedical Research Laboratory	X			X	80	20			80	20		
Letterman Army Institute of Research		X	--	--	90	10			90	10		
Medical Research Institute of Chemical Defense		X	--	--	100				100			
Walter Reed Army Institute of Research		X		X			100				100	
Total	10	10	6	6								
% of All Responses	50	50	50	50								
Mean Response					31	52	17	0.2	32	47	20	1

TABLE F.6

LIBRARY PARTICIPATION IN DTIC CURRENT AWARENESS BIBLIOGRAPHY (CAB) AND AUTOMATIC DOCUMENT DISTRIBUTION (ADD) PROGRAMS

Library	Current Awareness Bibliography Program		Automatic Document Distribution Program	
	No. of Profiles Maintained for Individual End-Users	No. of Profiles Maintained for Entire Laboratory	No. of Profiles Maintained for Individual End-Users	No. of Profiles Maintained for Entire Laboratory
Army Research Office	--	--	--	--
Ballistic Research Laboratory	22			1
Human Engineering Laboratory	--	--	--	--
Materials & Mechanics Research Center	--	--		1
Applied Technology Laboratory		1		1
Armament R&D Center	25			1
Benet Weapons Laboratory		1		1
Chemical R&D Center	3			1
Harry Diamond Laboratories	92		--	--
Redstone Scientific Information Center	4			1
Belvoir R&D Center	58		--	--

TABLE F.6 (Cont)

Library	Current Awareness Bibliography Program		Automatic Document Distribution Program	
	No. of Profiles Maintained for Individual End-Users	No. of Profiles Maintained for Entire Laboratory	No. of Profiles Maintained for Individual End-Users	No. of Profiles Maintained for Entire Laboratory
Natick R&D Center	4			1
Cold Regions Research and Engineering Laboratory	--	--	3	
Research Institute for the Behavioral and Social Sciences	3			2
Medical R&D Command	--	--		1
Medical Bioengineering R&D Laboratory	--	--	--	--
Medical Research Institute of Infectious Diseases	--	--	--	--
Aeromedical Research Laboratory	--	--	5	
Letterman Army Institute of Research	--	--	--	--
Medical Research Institute of Chemical Defense	2		--	--
Walter Reed Army Institute of Research	--	--	--	--
Total	213	2	8	11

Table F.7

LIBRARY PROCEDURES FOR PROCESSING END USER INFORMATION REQUESTS

Library	End-User Methods of Submitting Information Requests to the Library: % Written Request	% Telephonic Request	% Requests Made In Person	% Other	Library Uses Personal Interviews with End Users to Discuss Information Requests: Always	Usually	Sometimes	Never	End Users are Present While DROLS Terminal Operator Conducts Search of DTIC Data Base: Always	Usually	Sometimes	Never
Army Research Office	10		90			X					X	
Ballistic Research Laboratory	35	30	35		X				X			
Human Engineering Laboratory	5	10	85				X				X	
Materials & Mechanics Research Center	15	15	70		X					X		
Applied Technology Laboratory	30	10	30	30	X						X	
Armament R&D Center	20	20	60			X				X		
Benet Weapons Laboratory	20	40	40			X					X	
Chemical R&D Center	70	10	20			X					X	
Harry Diamond Laboratories	30	25	45			X				X		
Redstone Scientific Information Center	10	40	50			X					X	
Belvoir R&D Center	10	10	80			X					X	
Natick R&D Center	70	10	20			X					X	
Cold Regions Research and Engineering Laboratory	100				X				Not Applicable 1/			

Table F.7 (Cont)

Library	End-User Methods of Submitting Information Requests to the Library: % Written Request	% Telephonic Request	% Requests Made In Person	% Other	Library Uses Personal Interviews with End Users to Discuss Information Requests: Always	Usually	Sometimes	Never	End Users are Present While DROLS Terminal Operator Conducts Search of DTIC Data Base: Always	Usually	Sometimes	Never
Research Institute for the Behavioral and Social Sciences	30	30	40		X						X	
Medical R&D Command	20	60	20				X				X	
Medical Bioengineering R&D Laboratory	60	10	30				X			Not Applicable		
Medical Research Institute of Infectious Diseases			100					X		Not Applicable		
Aeromedical Research Laboratory	10	10	80		X					X		
Letterman Army Institute of Research	10	5	85		X						X	
Medical Research Institute of Chemical Defense			100		X						X	
Walter Reed Army Institute of Research	75	20	5			X				Not Applicable		
Total					8	9	3	1	1	4	12	0
% of All Responses					38	43	14	5	6	23	71	0
Mean Response	30	17	52	1.4								

1/ Libraries without DROLS Terminals could not respond to this question.

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TABLE F.8

FREQUENCY OF AND REASONS FOR END-USERS' REQUESTS FOR DTIC INFORMATION

Library	End Users Request Library To Search DTIC Data Bases When Submitting a Request for Information				End-Users' Reasons for requesting Information from DTIC Data Bases						
	Always	Usually	Sometimes	Never	To Conduct Background Research for ILIR Programs	To Identify Others Working in Specific S&T Areas	To Demonstrate That R&D Project Is Unique	To Search For New Technology	To Evaluate State of Art in S&T Area	To Verify References for Background Research	Other
Army Research Office		X				X		X	X		
Ballistic Research Laboratory		X			X		X	X	X		
Human Engineering Laboratory			X			X		X	X	X	
Materials & Mechanics Research Center		X			X	X	X	X			
Applied Technology Laboratory		X				X	X	X	X		
Armament R&D Center			X			X	X	X	X		
Benet Weapons Laboratory		X			X	X	X	X			
Chemical R&D Center			X		X	X		X	X		
Harry Diamond Laboratories			X		X	X		X		X	
Redstone Scientific Information Center		X			X		X	X	X		
Belvoir R&D Center		X				X		X	X	X	

TABLE F.8 (Cont)

Library	End Users Request Library To Search DTIC Data Bases When Submitting a Request for Information				End-Users' Reasons for requesting Information from DTIC Data Bases						
	Always	Usually	Some-times	Never	To Conduct Back-ground Research for ILIR Programs	To Identify Others Work-ing in Specific S&T Areas	To Demon-strate That R&D Project Is Unique	To Search For New Tech-nology	To Evaluate State of Art in S&T Area	To Verify References for Background Research	Other
Natick R&D Center	X						X	X	X	X	
Cold Regions Research and Engineering Laboratory			X		X	X	X		X		
Research Institute for the Behavioral and Social Sciences		X				X		X	X	X	
Medical R&D Command			X			X	X	X		X	
Medical Bioengineering R&D Laboratory			X		X	X			X	X	
Medical Research Institute of Infectious Diseases			X		X	X					
Aeromedical Research Laboratory			X				X			X	X
Letterman Army Institute of Research			X			X	X	X	X		
Medical Research Institute of Chemical Defense			X				X		X	X	X

TABLE F.8 (Cont)

Library	End Users Request Library To Search DTIC Data Bases When Submitting a Request for Information				End-Users' Reasons for requesting Information from DTIC Data Bases						
	Always	Usually	Sometimes	Never	To Conduct Background Research for ILIR Programs	To Identify Others Working in Specific S&T Areas	To Demonstrate That R&D Project Is Unique	To Search For New Technology	To Evaluate State of Art in S&T Area	To Verify References for Background Research	Other
Walter Reed Army Institute of Research		X			X		X			X	
Total	1	9	11	0	10	15	13	15	14	10	2
% of All Responses	5	43	52	0	48	71	62	71	67	48	9

TABLE F.9

LIBRARY EVALUATION OF BENEFITS AND SHORTCOMINGS OF DTIC INFORMATION RESOURCES AND SERVICES

Library	DTIC Information Appears to Satisfy End-User Requests				Benefits of DTIC Information 6=Most Frequent; 0=Not Applicable							Shortcomings of DTIC Information and Services 6=Most Frequent; 0=Not Applicable					
	Always	Usually	Sometimes	Never	Reduction in R&D Project Time	Cost Reduction	Prevention of Duplication of DoD R&D Effort	Reduction in Information Search Time	Unique Information Source	Stimulation of New Designs/Methods	Other	Provides Excessive Bibliographic References	Provides Insufficient Bibliographic References	Slow Distribution of Hard Copy Documents	Information Not Relevant	Information Not Current	Other
Army Research Office		X			0	0	5	6	6	0	0	0	0	6	0	0	0
Ballistic Research Laboratory		X			6	5	6	4	5	3	0	4	1	6	1	1	0
Human Engineering Laboratory		X			6	1	5	4	2	3	0	0	0	6	0	0	0
Materials & Mechanics Research Center		X			4	2	5	1	6	3	0	0	0	6	0	0	0
Applied Technology Laboratory		X			4	2	5	6	3	1	0	2	3	5	1	6	4
Armament R&D Center		X					--No Response--						--No Response--				
Benet Weapons Laboratory		X			4	2	3	5	6	1	0	0	0	6	0	0	0
Chemical R&D Center		X			3	1	4	5	6	2	0	2	4	5	3	6	0
Harry Diamond Laboratories		X			5	4	5	4	5	4	0	0	0	0	0	6	5

TABLE F.9 (Cont)

Library	DTIC Information Appears to Satisfy End-User Requests				Benefits of DTIC Information 6=Most Frequent; 0=Not Applicable							Shortcomings of DTIC Information and Services 6=Most Frequent; 0=Not Applicable					
	Always	Usually	Sometimes	Never	Reduction in R&D Project Time	Cost Reduction	Prevention of Duplication of DoD R&D Effort	Reduction in Information Search Time	Unique Information Source	Stimulation of New Designs/Methods	Other	Provides Excessive Bibliographic References	Provides Insufficient Bibliographic References	Slow Distribution of Hard Copy Documents	Information Not Relevant	Information Not Current	Other
Redstone Scientific Information Center		X			5	5	6	5	6	4	0	0	0	6	0	0	0
Belvoir R&D Center		X			6	5	3	2	4	1	0	6	2	3	5	4	0
Natick R&D Center		X			5	4	6	0	0	3	0	6	0	5	4	0	0
Cold Regions Research and Engineering Laboratory			X		3	1	6	4	5	2	0	0	6	0	5	0	0
Research Institute for the Behavioral and Social Sciences		X			6	5	6	4	5	3	0	4	5	6	3	3	0
Medical R&D Command	--No Response--				0	0	5	0	6	0	0	0	0	0	0	0	0
Medical Bioengineering R&D Laboratory		X			4	3	5	2	6	1	0	0	0	0	0	0	6
Medical Research Institute of Infectious Diseases		X			0	0	4	0	5	0	0	0	0	0	0	0	0

TABLE F.9 (Cont)

Library	DTIC Information Appears to Satisfy End-User Requests				Benefits of DTIC Information 6=Most Frequent; 0=Not Applicable							Shortcomings of DTIC Information and Services 6=Most Frequent; 0=Not Applicable					
	Always	Usually	Sometimes	Never	Reduction in R&D Project Time	Cost Reduction	Prevention of Duplication of DoD R&D Effort	Reduction in Information Search Time	Unique Information Source	Stimulation of New Designs/Methods	Other	Provides Excessive Bibliographic References	Provides Insufficient Bibliographic References	Slow Distribution of Hard Copy Documents	Information Not Relevant	Information Not Current	Other
Aeromedical Research Laboratory		X			4	0	3	5	6	2	0	0	0	6	0	0	0
Letterman Army Institute of Research	X				2	1	3	4	6	5	0	0	4	6	0	5	0
Medical Research Institute of Chemical Defense			X		4	3	5	0	6	0	0	5	0	0	6	0	0
Walter Reed Army Institute of Research		X			4	5	6	0	0	0	0	0	0	6	0	0	0
Total	1	17	2	0													
% of All Responses	5	85	10	0													
Mean Response					3.8	2.5	4.8	3.1	4.7	1.9	0	1.5	1.3	3.9	1.4	1.6	0.8

APPENDIX G
END-USER SURVEY DATA AND COMMENTS

G.1. This appendix contains two annexes that supplement information provided in Section VI of the report:

- Annex 1, End-User Survey Data
- Annex 2, End-User "Case Studies" and General Comments.

G.2. Annex 1 includes 7 tables that show data for the individual R&D centers and laboratories that responded to the survey. Tables G.1 through G.3 contain data collected from end users during the Phase I survey. Tables G.4 through G.7 contain data collected on the detailed end-user questionnaires during Phase II.

G.3. Annex 2 provides selected "case studies" and general comments about DTIC resources included on the Phase II questionnaires. The "case studies" describe fairly specific situations in which DTIC resources helped respondents accomplish their work.

ANNEX 1
END-USER SURVEY DATA

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TABLE G.1

END-USERS' EVALUATION OF DTIC INFORMATION RESOURCES

Organization	DTIC Users		Value Rating*					
			0	1	2	3	4	5
	No.	%	No.	No.	No.	No.	No.	No.
Army Research Office	21	70	--	3	6	4	7	1
Ballistic Research Laboratory	196	68	1	19	28	60	60	25
Human Engineering Laboratory	58	85	--	2	2	17	18	16
Materials & Mechanics Research Center	77	72	--	3	3	27	25	19
Aviation R&T Labs HQ and Aeromechanics Lab	9	25	--	2	1	4	2	--
Applied Technology Laboratory	98	92	--	1	3	37	39	18
Chemical R&D Center	218	47	--	8	21	83	71	32
Fire Control and Small Caliber Weapons Systems Laboratory	26	59	--	--	--	10	9	7
Large Caliber Weapons Systems Laboratory	26	96	--	--	3	9	12	2
Communications-Electronics R&D Center	44	45	--	2	6	20	9	5

* 0 = Not Valuable, 5 = Highly Valuable.

TABLE G.1 (Cont)

Organization	DTIC Users		Value Rating*					
			0	1	2	3	4	5
	No.	%	No.	No.	No.	No.	No.	No.
Atmospheric Sciences Laboratory	32	57	--	--	7	12	11	2
Combat Surveillance and Target Acquisition Laboratory	26	42	--	1	3	8	7	6
Electronics Technology and Devices Laboratory	85	55	--	7	15	26	22	13
Electronic Warfare Laboratory	22	52	--	--	3	7	9	3
Harry Diamond Laboratories	142	60	--	5	7	43	46	34
Night-Vision and Electro-Optics Laboratory	91	55	2	1	13	30	35	7
Army Missile Laboratory	223	56	1	7	19	73	80	40
Tank-Automotive Systems Laboratory	81	70	--	4	7	35	27	7
Belvoir R&D Center	132	65	--	5	15	50	43	14
Natick R&D Center	133	54	1	14	21	37	39	18
Cold Regions Research and Engineering Laboratory	23	58	--	4	6	6	4	3

TABLE G.1 (Cont)

Organization	DTIC Users		Value Rating[a]					
			0	1	2	3	4	5
	No.	%	No.	No.	No.	No.	No.	No.
Aeromedical Research Laboratory	17	90	--	1	2	5	7	2
Letterman Army Institute of Research	25	26	--	2	3	7	8	5
Medical Bioengineering R&D Laboratory	34	71	--	4	6	9	9	6
Medical Research Institute of Chemical Defense	24	57	--	1	6	9	3	4
Total	1,863	59	5	96	206	628	602	289

TABLE G.2

END-USER EVALUATION OF BENEFITS OF DTIC INFORMATION RESOURCES AND SERVICES

Organization	DTIC Users		Unique Information Source	Reduction in Information Search Time	Reduction in R&D Project Time	Cost Reduction	Prevention of Duplication of DoD R&D Efforts	Stimulation of New Designs/Methods	Other
	No.	%	No.	No.	No.	No.	No.	No.	No.
Army Research Office	21	70	8	10	--	1	--	--	2
Ballistic Research Laboratory	196	68	61	87	16	--	16	4	10
Human Engineering Laboratory	58	85	13	27	6	1	9	1	1
Materials & Mechanics Research Center	77	72	25	35	9	--	5	1	2
Aviation R&T Labs HQ and Aeromechanics Lab	9	25	3	3	--	1	--	2	--
Applied Technology Laboratory	98	92	10	57	9	--	22	--	--
Chemical R&D Center	218	47	80	100	13	--	17	6	1
Fire Control and Small Caliber Weapons Systems Laboratory	26	59	8	12	5	--	1	--	--

TABLE G.2 (Cont)

Organization	DTIC Users		Unique Information Source	Reduction in Information Search Time	Reduction in R&D Project Time	Cost Reduction	Prevention of Duplication of DoD R&D Efforts	Stimulation of New Designs/Methods	Other
	No.	%	No.	No.	No.	No.	No.	No.	No.
Large Caliber Weapons Systems Laboratory	26	96	9	12	4	--	1	--	--
Communications-Electronics R&D Center	44	45	9	22	6	--	4	1	1
Atmospheric Sciences Laboratory	32	57	11	12	5	--	1	3	--
Combat Surveillance and Target Acquisition Laboratory	26	42	5	13	5	--	1	2	--
Electronics Technology and Devices Laboratory	85	55	28	37	11	1	3	1	4
Electronic Warfare Laboratory	22	52	6	13	1	--	--	2	--
Harry Diamond Laboratories	142	60	38	67	13	2	14	3	5
Night-Vision and Electro-Optics Laboratory	91	55	35	42	4	--	7	--	3

TABLE G.2 (Cont)

Organization	DTIC Users		Unique Information Source	Reduction in Information Search Time	Reduction in R&D Project Time	Cost Reduction	Prevention of Duplication of DoD R&D Efforts	Stimulation of New Designs/Methods	Other
	No.	%	No.	No.	No.	No.	No.	No.	No.
Army Missile Laboratory	223	56	58	111	27	3	16	4	2
Tank-Automotive Systems Laboratory	81	70	21	36	5	--	14	1	4
Belvoir R&D Center	132	65	34	61	10	4	19	1	1
Natick R&D Center	133	54	47	38	12	1	25	2	7
Cold Regions Research and Engineering Laboratory	23	58	10	4	5	--	2	--	2
Aeromedical Research Laboratory	17	90	7	7	1	--	2	--	--
Letterman Army Institute of Research	25	26	8	10	4	--	1	--	2
Medical Bioengineering R&D Laboratory	34	71	19	2	6	1	5	1	--
Medical Research Institute of Chemical Defense	24	57	16	2	1	--	4	1	--
Total	1,863	59	569	820	178	15	189	36	47

TABLE G.3

REASONS FOR NON-USE OF DTIC INFORMATION RESOURCES

Organization	Non-Users of DTIC		Not Aware of DTIC	Inconvenient	Information Not Relevant	Other
	No.	%	No.	No.	No.	No.
Army Research Office	9	30	4	2	1	2
Ballistic Research Laboratory	92	32	46	9	10	27
Human Engineering Laboratory	10	15	4	1	2	3
Materials & Mechanics Research Center	29	27	17	2	1	8
Aviation R&T Labs HQ and Aeromechanics Lab	26	72	21	--	--	5
Applied Technology Laboratory	9	8	1	--	2	6
Chemical R&D Center	248	53	159	13	26	47
Fire Control and Small Caliber Weapons Systems Laboratory	18	41	10	3	2	3
Large Caliber Weapons Systems Laboratory	1	4	--	--	--	1
Communications-Electronics R&D Center	53	55	36	11	--	6
Atmospheric Sciences Laboratory	24	43	17	2	1	4

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TABLE G.3 (Cont)

Organization	Non-Users of DTIC		Not Aware of DTIC	Inconvenient	Information Not Relevant	Other
	No.	%	No.	No.	No.	No.
Combat Surveillance and Target Acquisition Laboratory	35	57	24	3	5	2
Electronics Technology and Devices Laboratory	70	45	42	12	5	11
Electronic Warfare Laboratory	19	45	14	--	2	3
Harry Diamond Laboratories	94	40	61	4	10	19
Night-Vision and Electro-Optics Laboratory	75	45	40	10	12	12
Army Missile Laboratory	160	40	110	27	5	18
Tank-Automotive Systems Laboratory	33	29	14	4	3	12
Belvoir R&D Center	70	35	43	3	9	15
Natick R&D Center	113	46	70	7	12	21
Cold Regions Research and Engineering Laboratory	16	40	10	--	3	2
Aeromedical Research Laboratory	1	5	--	--	--	1

TABLE G.3 (Cont)

Organization	Non-Users of DTIC		Not Aware of DTIC	Inconvenient	Information Not Relevant	Other
	No.	%	No.	No.	No.	No.
Letterman Army Institute of Research	69	73	55	--	2	11
Medical Bioengineering R&D Laboratory	13	27	6	1	1	5
Medical Research Institute of Chemical Defense	17	41	9	4	--	4
Total	1,304	41	813	118	114	248

TABLE G.4

SCIENTISTS AND ENGINEERS SOURCES OF S&T INFORMATION--DETAILED END-USER SURVEY RESPONSES

Percentage of Total S&T Information Derived From Following Sources:	Percentile 0		10		20		30		40		50		60		70		80		90		100	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Journals	3	2	27	16	25	14	35	20	23	13	25	14	6	3	11	6	13	7	4	2	2	1
Professional Associations & Conferences	22	13	59	34	44	25	36	21	10	6	2	1	-	-	1	0.6	-	-	-	-	-	-
Contacts With Other Scientists	7	4	40	23	35	20	45	26	15	9	16	9	6	3	3	2	4	2	2	1	1	0.6
Automated Information Systems	51	30	58	33	26	15	22	13	4	2	7	4	1	0.6	3	2	2	1	-	-	-	-
Other	137	79	17	10	7	4	6	4	3	2	4	2	-	-	-	-	-	-	-	-	-	-

	Percentile 0		10		20		30		40		50		60		70		80		90		100	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Percentage of S&T Information Obtained from DTIC	10	6	60	35	24	14	27	16	13	8	9	5	3	2	4	2	11	6	6	4	4	2

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TABLE G.5

END USERS' USE OF DTIC INFORMATION RESOURCES

Use of DTIC Information Resources	Number of Times During Past Year																					
	0		1-10		11-20		21-30		31-40		41-50		51-60		61-70		71-80		81-90		91-100	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Number of responses to information requests that have included DTIC information during past year	29	17	112	67	17	10	2	1	--	--	3	2	1	0.6	1	0.6	1	0.6	1	0.6	1	0.6
Number of requests for DTIC information made during past year	38	22	106	62	19	11	4	2	2	1	2	1	--	--	--	--	--	--	--	--	--	--
Number of requests for DTIC products during past year:																						
Bibliographies	93	54	76	44	3	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Technical Reports	47	27	97	56	19	11	4	2	--	--	2	1	--	--	1	0.6	1	0.6	1	0.6	--	--
Work Unit Summaries	125	73	46	27	1	0.6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Other	167	97	5	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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TABLE G.6

HOURS PER MONTH END USERS SPEND READING DTIC PRODUCTS

Item	Hours											
	0		1-10		11-20		21-30		31-40		41-90	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Current Awareness Bibliography	130	74	43	25	--	--	--	--	--	--	--	--
Other Bibliographies	109	63	63	37	1	0.6	--	--	--	--	--	--
Technical Reports	43	25	96	55	21	12	8	4	5	3	2	1.2
Work Unit Summaries	129	75	44	25	--	--	--	--	--	--	--	--
Technical Abstract Bulletin	134	78	39	23	--	--	--	--	--	--	--	--
Other Products	167	97	6	4	--	--	--	--	--	--	--	--

TABLE G.7

END USERS' EVALUATION OF AND SATISFACTION WITH DTIC INFORMATION RESOURCES--DETAILED SURVEY RESPONSES

Value of DTIC Information Resources to Scientists and Engineers' Work

(0 = Not Valuable; 5 = Extremely Valuable)

Value Rating	No.	%
0	5	2.9
1	6	3.5
2	9	5.3
3	31	18.1
4	50	29.2
5	70	40.9

Satisfaction Rating	No.	%
0	--	--
1	2	1.2
2	5	3.0
3	24	14.6
4	61	37.2
5	72	43.9

ANNEX 2
END-USER CASE STUDIES AND GENERAL COMMENTS

Case Studies. The following case studies were selected from the 87 Phase II questionnaires that provided information on specific situations in which the availability of DTIC resources saved the responding individuals project time and/or money or otherwise helped them perform their R&D work. Eight case studies not provided below are included in Section VI of the report.

Saved 5 weeks and $10,000:

> "I was able to get at least a paragraph on current projects being performed which are reported in journals not easily read by me. My biggest problem is to process or digest the numerous abstracts and then to get copies of the papers and translations from serbocroatian for example. This can cause a tremendous problem with our library staff. There should be a way to go into the data base and automatically request copies of papers either through FIO or other groups so that our librarians aren't unduly tasked. Also what would or could help for routine correspondence would be to have prelabelled post cards like the ones used by NIH to request original papers (since xeroxing is not always appropriate especially when articles are in obscure or foreign journals). These could even then be prepared by computer by checking off on the DTIC list, or from the other data bases. The DTIC list is particularly important because that is where the gov't reports are such as other lubricants people, etc." (BRDC)

Saved 4 weeks and $10,000:

> "After DTIC Literature search was performed in the area of survivability/survivability analysis, engineering personnel of CENSEI were informed of analysts in the field, contractors, and other government agencies performing work in this area. The literature search provided valuable information in the early stages and on into the investigation." (CECOM)

Saved 3 weeks and $100,000:

"In the performance of R&D for 25 mm long rod penetrator, information and contacts obtained through reports provided by DTIC assisted us greatly in formulating tungsten alloys. These alloys, in turn, to be used in a vacuum and double electrode remelt program is [sic] the core of this aspect of long rod penetrator research." (FSL)

Saved 3 weeks and $10,000:

"I was tasked with finding new methods to check the fit of a respirator on a soldier in the field. DTIC was used to search the literature for old and new detection techniques etc. The DTIC system was extremely helpful in seeing what work had been done previously in this area. It really saved a lot of time on the project." (CRDC)

Saved 2 weeks and $3,000:

"This service enabled me to determine that my ILIR program ("Multipactor Beam Amplifier") is relevant and unique. In addition, the service provided the necessary background information for mathematical/theoretical and prior experimental art to implement the program." (ETDL)

Saved 10 weeks and $4,000:

"Information pertaining to the ADAM system was provided by DTIC. The info. saved manhours and money which otherwise would have been used to duplicate tests conducted by ARRADCOM." (CRDC)

Saved 10 weeks:

"There was a need to rapidly assess the present state-of-the-art in tungsten alloying/processing. A DTIC search revealed a new source of tungsten

development (at NASA) not previously considered appropriate to Army's needs. A more critical assessment of the information provided has lead to a new processing/materials approach for composite tungsten materials that hopefully will draw upon the existing NASA technology as well as develop new approaches specifically for Army's needs." (FSL)

Saved 3 weeks:

"I have recently initiated an investigation into the use of lasers for production of electro-optical materials. The information gained through DTIC allowed me to quickly evaluate the state-of-the-art and problems encountered in producing materials of Army interest. This is very valuable to me as I can determine quickly where improvements are needed, what problems are significant and avoid the waste of my time and the Army's money." (MICOM)

Saved 2 weeks:

"During the last calender year I was involved in developing an aerodynamic prediction program for cone-cylinder-flare projectiles. From some personal contacts around the Laboratory I learned of extensive wind-tunnel and ballistic range tests of the same projectile configuration. I was able to obtain these reports as well as others that were listed in report bibliographies, in a timely manner from DTIC. Those data were used to verify the prediction program. The reports in which these tests were published were quite old (1950-1960's) and from DoD Labs. that have since not published test results. DTIC allowed me to access data for an important aspect of program validation." (BRL)

Saved 2 weeks:

"DTIC survey was used to identify individuals/organizations working on target signature modeling, and as a source of documentation of the existing models and model development efforts. We used this DTIC information to evaluate the state of the art in thermal

target signature models, and to contact individuals involved in that modeling, in order to select the best signature model for target acquisition calculations." (NVEOL)

Saved 8 weeks:

"Terrain reflectivity data from a number of investigators was discussed in a publication in my possession but only averages or other modified forms of the original data were presented. I requested the HDL Library to obtain through DTIC, the publications containing the original data. We thus quickly received the needed, precise values of reflectivity for a variety of terrain types." (HDL)

Saved 12 weeks:

"A program, Protection of Structures from Terrorist Attack is currently being conducted. Information on terrorist use of bombs, small arms and rockets, and terrorist tactics, etc, obtained through DTIC, has been extremely useful and required little effort to obtain. Data not available at DTIC has required substantially more effort." (BRL)

Saved 2 weeks:

"I was doing a report on the climate of Honduras. Information on this topic is scarce and hard to obtain. A DTIC search produced references that I probably would not have located otherwise. One very useful report was published in 1959, and I do not believe that I could have found it without help from DTIC." (MICOM)

Saved 4 weeks:

"During the last several years, my section has been performing research on treatment of Army industrial wastewaters. DTIC has identified and provided access to a substantial number of technical reports of

direct relevance to this work. These reports have been valuable for designing our own experiments and for preparing manuscripts." (BRDL)

Saved 6 weeks:

"DTIC reports on previous investigation provided (1) the definition of present knowledge, (2) assistance in defining gaps in present information, (3) projection of future trends. Information from both U.S. and Soviet documents were used. This material served to assist in the analysis of the Army's command, control, communications, computers, and intelligence process." (HDL)

"Technical reports dealing with the electromagnetic shielding of composite materials were recently obtained from DTIC. These reports quickly informed us of the overall status of current research in this area--test methodologies, specific material performance characteristics, etc.--together with the names of researchers actively working in this field. The technical reports, and subsequent telephone conversations with the researchers involved, enabled us to precisely define our own research needs, and begin a research program geared to our requirements." (NRDC)

"DTIC identified projects & investigators that had done work in a military laboratory 10 years ago, but had not published the results in the open literature. DTIC provided names, abstracts, titles, & bibliographies which helped define parameters needed for a mathematical model of the eye." (MRICD)

"DTIC bibliography provided information for research that was conducted on advancing blade concept (ABC) helicopter. The technical reports that were obtained from the bibliography provided data on this particular aircraft that could be used to mathematically model the aircraft for simulation use. These simulations were to provide the Army with data to further explore the aircraft performance parameters required for the LHX (Advanced Light Helicopter)." (RTL)

General Comments About DTIC. The following comments, which were selected from the Phase II end-user questionnaires, are characteristic of respondents' comments about the use of DTIC resources and services. Other such comments not provided below are included in Section VI of this report.

> "The value of DTIC, as I see it, is to make it easy to find the state of the art in government-funded efforts. This means it helps avoid duplication of effort, often provides a better starting point for the effort expended, and may permit one to do a much better job for the same time and effort. In addition, it's a (good) source of documents that aren't in print elsewhere." (NVEOL)

> "This service is very valuable to the research community. It saves time and money for the DoD." (BRL)

> "DTIC services have been a valuable resource to this organization. We can keep up with current technology without having to scan through numerous technical journals. The responses have always been fast and reliable." (BRDC)

> "Outstanding source for finding in-house military & governmental tech. reports." (BRDL)

> "They give excellent results--particularly if the key words and phrases are carefully selected." (CRDC)

> "I have been very pleased with the information received for the amount of time invested." (MMRC)

> "DTIC services are invaluable; with the drive to establishing data bases that can be accessed by the bench scientist the turn-around time in technology awareness can be reduced sufficiently to avoid duplication of efforts as well as provide new approaches in materials development areas." (FSL)

"DTIC is a useful tool for doing types of searches for work being done in technical areas." (CECOM)

"I consider these services to be essential!" (HDL)

"I am very pleased that DTIC services are available. This availability allows me the freedom of knowing I can benefit from work done previously by DoD personnel and/or contractors. I do think that the CAB and TAB services could be made more widely available." (BRL)

"In many cases the information found in a single report, references included, saves a researcher many library hours trying to piece together the same or a similar set of data or information." (NVEOL)

"It's nice to be able to tell someone that a certain piece of work's been documented and that it can be obtained thru DTIC under thus & such number, author, and/or title." (BRL)

"Something should be done to ensure that the original microfilm copies are legible and that copies are made carefully from the microfilm. Some reports which are ordered from DTIC are easy to read, but many are hard to read. Occasionally it is impossible to read them." (MICOM)

"What kinds of services the DTIC can offer is not well known and publicized. They can help the end users if they can publish a monthly newspaper to tell the user what information is available from them." (NVEOL)